CHEM 2311
Organic Chemistry Laboratory – A Green Approach
Spring 2017
(Two-semesters-in-one, 4 credits)

INSTRUCTOR: Dr. Jane E. Wissinger, 468A Kolthoff Hall, 612-625-9586, jwiss@umn.edu

LECTURES: Tuesdays: 11:15 a.m.-12:05 p.m., 12:20 p.m.-1:10 p.m. (Bruininks 220) & 4:55 p.m.-5:45 p.m. (Smith 100)

OFFICE HOURS: Mondays/Wednesdays/ 11:00 a.m.-12:00 p.m., Tuesdays/Thursdays 3:30-4:30 p.m., and by appointment.

REQUIRED MATERIALS:
- A duplicating notebook, 75-100 pages in length, is required. You may purchase the Hayden McNeil product designed specifically (with helpful information on the cover flaps) for this course at the bookstore or one from an independent supplier.
- Iclicker2 - ISBN 9781429280471. See our Moodle site for instructions to register your device and create the link to Moodle. http://z.umn.edu/iclickerstudent
- Goggles are required, not safety glasses, and can be purchased at the bookstore. Alternatively, if you have goggles from a previous laboratory course, approval of your TA is required for use.

OPTIONAL MATERIALS: Though not required, it is recommended that a laboratory coat be worn to protect your clothing during experimental work. The laboratory coat should be 100% cotton (NOT a polyester blend so check the label carefully) and of the appropriate size so that sleeves do not extend beyond the wrists. Laboratory coats are available for purchase in the medical section of the Coffman bookstore for ca $22-25. Try on the coats hanging on the racks to be sure to purchase the correct size.

MOODLE WEBSITE: All course information, including the syllabus, reading assignments, worksheets, practice quizzes, the lecture Powerpoints, links to helpful websites on techniques and spectroscopy, grades and more will be posted on the class Moodle 3.0 site. Connect as soon as possible to assure you have access to the site. All laboratory reports will be uploaded and submitted to the Turnitin.com plagiarism prevention system through Moodle. I will also post announcements such as change of office hours and due dates on the website.

TECHNIQUE VIDEOS: A series of thirty technique videos and tips have been specifically designed for the 2311 course and are available on our course Moodle site. Students have found them very helpful as visual learning tools for learning to build new apparatus and understanding techniques. In fact, it is very obvious to TAs which students have watched the videos and which have not just by their level of confidence at the bench. They are also a good review for the final lab practical.

E-MAILS: Copy or include the name of your TA on all relevant correspondences. If you are sick or have an emergency, email me immediately or as soon as possible to let me know what your circumstances are. Then I can best address the situation with both you and your TA. Please use my e-mail address judiciously and respectfully since I will be teaching ca. 430 students this semester. Chemistry questions should be asked in office hours, after lecture or as I walk around lab. All announcements and handouts from lecture and worksheets will be posted on the 2311 Moodle site so please take the time to look for answers before you ask. Having said this I do look forward to getting to know many of you this semester from personal interactions in lab and my office.
PREREQUISITES: The 2311 course is to be taken following the lecture course, 2301 (C- or higher required) and concurrently with or subsequent to lecture course 2302 (C- or higher required).

TIPS FOR SUCCESS
1) **Attend Tuesday lab lectures.** The theory and purpose of each experiment will be discussed along with demonstrations and discussions of new techniques learned. Pertinent information concerning worksheet questions, lab reports, and quiz material will be shared at each lecture. The TAs will not repeat this material in lab so that students have more time for experimentation at the bench and interpretation of results. You are responsible for any changes in procedure or announcements given in lecture.

2) **Come prepared to lab!** This is probably the most important thing you can do with respect to safety for yourself and others, in addition to preparing yourself to work efficiently and effectively. Read ALL of the assigned material pertaining to each experiment. Your lab notebook will checked to assure that you have an outline of the procedure to be followed and that you understand all hazards and safety disposal protocols. You will find good experimental results will follow. Each lab will begin with a prelab DISCUSSION and/or quiz so that the TA can evaluate your preparation. Students that are ill-prepared for lab will not be allowed to perform the experiment and asked to leave.

3) **Watch the Technique Videos.** Over 92% of the students surveyed felt watching the videos gave them confidence and enhanced their skills in lab. It is a simple and expedient method of learning the “whys” of the techniques in lab.

4) **Think and be observant.** There is a reason for every step of a procedure and careful observations will enhance your understanding of the chemistry and your ability to react to the unexpected; which inevitably occurs in laboratory explorations. Mistakes are often irreversible so be deliberate and careful with each manipulation you perform.

SAFETY
The safety practices outlined on pages 1-13 of the Mohrig textbook and on page 2 of the Laboratory manual should be read before beginning the first experiment and reviewed frequently throughout the semester. Also, a contract confirming your understanding of the safety rules, waste handling and other important protocols of the course will be posted on our Moodle site and should be completed for any laboratory experiments may be performed. Special, note that Minnesota state law requires that safety goggles must be worn at all times when you are in the laboratory. TA’s are authorized to expel students from the laboratory who fail to obey this or other safety rules and a zero will be recorded for that day’s experiment. Any student found performing unauthorized experiments or behaving in an unsafe manner in the laboratory may be removed from the laboratory at any time. Whether or not behavior is unsafe is at the discretion of the instructors, and this includes failure to properly respond to instructions in a timely manner. Removal from the laboratory may be for a period of time as short as the remainder of the current lab period or as long as the remainder of the course itself, depending on circumstances.

WASTE DISPOSAL
It is extremely important that each and every 2311 student disposes of their chemicals in the proper manner according to the Waste Disposal instructions given at the end of each experiment and summarized on pp. 3-5 of the Manual. Improper handling of waste will initially be reflected in a low technique grade and repeated offenses will warrant removal from lab and a zero for that day’s experiment.

GRADING POLICY – [University of Minnesota Grading and Transcript Policies](https://www.registrar.umn.edu/grading/grading-policy)
Your grade for the 2311 course will be based on the sum total of your points earned according to the rubric below.

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>(1) Worksheets</td>
<td>750</td>
<td>37.50 %</td>
</tr>
<tr>
<td>(2) Full Reports</td>
<td>600</td>
<td>30.00 %</td>
</tr>
<tr>
<td>(3) Lecture Attendance (1 pt. x #lectures x 10 = max. 100 pts)</td>
<td>100</td>
<td>5.00 %</td>
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<tr>
<td>(3) Preparation (notebook documentation)</td>
<td>100</td>
<td>5.00 %</td>
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<tr>
<td>(4) Safety/Technique/Participation/Product</td>
<td>150</td>
<td>7.50 %</td>
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<tr>
<td>(5) Quizzes (200 pts) + Lab Practical (100 pts)</td>
<td>300</td>
<td>15.00 %</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>2000</strong></td>
<td><strong>100.00 %</strong></td>
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Recognize that when 420 students are divided into sections of 16-18 students, the distribution of As, Bs, and Cs within these small sections will not be exactly the same. Therefore, it is inappropriate for me to propose that each section will have “x” number of A’s, “y” number of A-‘s, etc… Overall, in the course, it is expected that ~ 30% of the students will earn an A or A- (evenly divided), ~ 40 % B+/B/B -, and ~ 20 % Cs. That is, the overall average in the 2311 class will be a grade of B. Also, recognize that even though the 25 TAs teaching the class have the same grading keys, there can be variations in grading style which will affect their average. For these reasons, I review each sections grades individually mid-semester and at the end of the semester and consider the composition of the students, the average, and standard deviation to assure that each student receives the grade they have earned in my class. An example of a typical grade distribution is given below but should not be generalized for all sections.

Example of 2311 grades based on an average total points of 1660: A (> 1800), A- (> 1740), B+ (> 1700), B (> 1640), B- (> 1580), C+ (> 1540), C (> 1460), C- (> 1360), D (> 1260), F (< 1260). Total points, not percentages are used for grading.

WORKSHEETS AND REPORTS
The results of the experiments will be reported on worksheets (designated WS on the calendar) or in the format of a scientific laboratory report (designated by LR on the calendar). ALL worksheets and reports are to be turned in at the beginning of the designated lab period or points (5 pts/day, including weekends) will be deducted. No exceptions without written documentation and prior approval of TA or instructor. If a worksheet or report is turned in late is should be given directly to your TA or placed in the locked box outside of Smith 115 with the date and time submitted. Reports should be written as described in the “Report Guidelines” on pp. 121-122 of the manual (Wissinger, 14th edition) and illustrated in the sample report pp. 123-126. All written work should represent your own original data (from your experimental notebook) and scientific interpretation, whether the experiment was done individually or in pairs.

Copies of the worksheets will be posted on the Moodle 3.0 site should you need a second copy and any extra directions given for laboratory reports. For laboratory reports, it is preferred that chemical structures be drawn using ChemDraw available through a University of Minnesota site license or another chemical drawing program. Instructions for downloading this software are posted on our website. This program is also available on the 90 computers that reside in the Walter 103 computer lab for your convenience. (Note, small monitor PCs only). Optionally, chemical structures may be drawn by hand. What is NOT allowed is the use of chemical structures copied from the internet, Wissinger manual, PowerPoint presentations, other students work, etc. See scholastic dishonesty discussion below for consequences of non-compliance.

PREPARATION/NOTEBOOK
Clicker and/or REEF polling (in-class participation) – Attendance at lecture will be monitored throughout the semester using the iclicker2 system or REEF polling and will part of your preparation grade. This will assure all students are prepared to work safely and efficiently at the bench and avoid unnecessary repetition of information by TAs. I will also share important information about changes to experiments, tips for the worksheets and laboratory reports, and the relevancy of the experiment to lecture course or societal topics. There will be 12 lectures during the semester (excluding Day #1) of which 10 will be counted toward a maximum of 100 pts towards your grade (5.0%). The extra two lectures allows for forgetting your clicker or missing a lecture due to illness. You are responsible to check that your responses are recorded and for the proper functioning of your device. I will not retroactively award participation points. The clicker class channel frequency is AA.

Notebook Preparation and Use – Notebook preparation is an essential part of preparing to perform experiments. Details on expectations are described on pp. 10-11 of the manual. If properly prepared, a student should be able to rely solely on his/her duplicating notebook and have no need to refer to either the Mohrig textbook or manual during an experiment. Regular collection of notebook duplicating pages and prelab quizzes (worth 10 pts each) will evaluate your preparation during the semester. The notebook is not only essential for preparation but also for recording all data and observations during an experiment. See pp. 10-11 of the manual for suggestions on how to organize your notebook for recording data such as chemical properties, reaction times, color changes etc. during lab work. At the completion of lab on random days, copies of notebook pages will be turned in for grading (10 pts) and checked for accuracy.
TECHNIQUE/PARTICIPATION

Technique – TAs will grade your technique in two ways. The first is by observing your skillfulness at the bench. This includes safety, handling of waste, ability to setup apparatus correctly, perform the required techniques (such as extraction or crystallization) and your ability to make/react to scientific observations. A standard grade for technique, as shown in the rubric posted on the Moodle page, is a 5; reflecting meeting expectations of following procedure and performing the procedure. As the semester progresses, grades can increase up to 10 for students demonstrating efficiency, the ability to independently problem-solve, multi-task, and work scientifically at the bench. Alternatively, students who do not follow procedures, need constant assistance, are irresponsible with their waste handling, or are unsafe will earn lower techniques grades. Repeated tardiness to lab will also be reflected in the technique/participation grade.

Pre- and Post-Lab Discussions – On multiple occasions during the semester, time will be devoted in lab for sharing data and discussing results. You will be graded on your participation and contribution to the discussions. Again, a score of 5 is meeting expectations, whereas showing critical thinking skills, knowledge about the experiment, and insightfulness in drawing conclusions will earn more points.

Product Grades – Three products will be graded as a reflection of your technique. Products collected and graded are designated with a “*” on the calendar. They should be turned in at the end of the laboratory period to receive full credit. To turn in a sample, prepare a label with your name, notebook page reference, compound name, and melting point and attach it securely to the vial. Transfer your sample to the vial and place it in the box designated by your TA. It is absolutely essential that the vial be labeled properly so that if it is misplaced it need not be treated as hazardous unknown waste – a costly situation. TAs will grade your product based on purity, color, crystallinity and melting point/boiling pt. (0-5 pts), as well as yield (0-5 pts).

Quizzes – Three quizzes will be given at the beginning of the following lab periods: Quiz #1 (2/13, 2/14), Quiz #2 (3/22, 3/23), and Quiz #3 (4/19, 4/20). If you arrive late to lab that day, you will be given only the time remaining according to the students already taking the exam. No make-up quizzes are given without a documented excuse. Quiz questions will focus on material covered in lecture, chemical theory, mechanisms, spectroscopy, readings, and basics of new techniques. A summary of quiz material will be posted on the 2311 Moodle site.

Lab Practical – Lab practical exams will be administered in lab April 26 and April 27. Each student will be assigned a specific one-hour time slot for testing. The exam will focus on safety, waste handling, technical skills at the bench, apparatus building, and yield calculations. It is worth 100 points. More details on the specific format will be provided later in the semester.

MAKE-UP POLICY
Missed experiments can be made-up only for valid reasons (e.g. documented illness or family emergency) with my approval. Several “make-up” days are scheduled throughout the semester and are to be used to complete any experiment missed up to that point. You may not simply choose to miss a lab and plan to make it up on a makeup day. You must have approval and a valid excuse for missing the regularly scheduled experiment time. Work completed on makeup days is due within the same time allotment given to the experiment on the regular schedule.

INCOMPLETES
Incompletes are rarely given for this lab and will only be considered if over two-thirds of the experiments are completed, the work up to that point is turned in and satisfactory for a passing grade, and circumstances are extenuating.

CONDUCT AND DISCIPLINE – University of Minnesota Student Conduct Code

Scholastic Dishonesty - The Board of Regents Student Conduct Code states that, “Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis.” As applied to the 2311 course this means
that copying laboratory reports or falsifying data will not be tolerated. Altering a report or worksheet and then submitting it for a re-grade is also an act of scholastic dishonesty.*

**Partner Work:** Throughout the semester you are asked to work in pairs. It is expected that you will share the data, but all interpretation should be your own. Be sure to reference any source material you used to answer questions, such as textbooks like Smith, Wade, or Mohrig, and be careful to either rephrase in your own words or correctly use quotation marks when appropriate.

**Turnitin.com:** It is required that all reports for the course be submitted to the Turnitin plagiarism prevention program on our Moodle site. This program analyzes each report for content matching with data and reports from students currently in the course, those from previous semesters, and internet sources. All reports with approximately 15% and above matching results will be manually compared to the sources indicated and you will be contacted if there is a problem. Reports with less than 15% matching may also be reviewed.

**Shared Graded work:** Using graded work from a student who took this course in a previous semester is considered an act of scholastic dishonesty. In addition, if your work is given to and then copied by a student following your enrollment in this course you will also be liable and at risk of participating in an act of scholastic dishonesty. Grades may be changed retroactively. Protect your work and integrity. Do not leave your 2311 course work on a public computer, in a file of a fraternity or sorority, or on a website.

*If a student is guilty of scholastic dishonesty, he/she will receive no credit (hence a zero) for the work involved, and the incident will be reported to the Office of Student Conduct and Academic Integrity (OSCAI). In the case of a serious or repeated offense, an “F” will be given for the course and the incident reported to the OSCAI. For student information and questions go to: http://www1.umn.edu/oscai/.

In summary, an act of scholastic dishonesty is:

1) Worksheet answers which are copied or recognizably similar between two students in the 2311 class.
2) Statements or paragraphs that are directly copied from my manual, Mohrig, Wade, or any internet source without quotes or proper reference.
3) Scanned or shared graphics of reaction schemes or mechanisms.
4) Using data other than your own recorded in your laboratory notebook.
5) Reports that Turnitin.com identifies as plagiarized from one or more sources.

**Student Mental Health and Stress Management:** As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. University of Minnesota services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via [http://www.mentalhealth.umn.edu/](http://www.mentalhealth.umn.edu/).

Links to:
- Board of Regents Policy: [Student Conduct Code](http://www.umn.edu/moralconduct/)
- Board of Regents Policy: [Sexual Harassment](http://www.umn.edu/about/studentlife/safety/campussecurity/intimacy)
- Board of Regents Policy: [Equity, Diversity, Equal Employment Opportunity, and Affirmative Action](http://www.umn.edu/diversity)
- Board of Regents Policy: [Academic Freedom and Responsibility](http://www.umn.edu/about/studentlife/safety/campussecurity/intimacy)

**Final Comments:** As with any laboratory course, getting good results takes patience, perseverance, and an open-mind for observations and discovery. If an experiment is not going as expected, investigate why and take pride in problem-solving and getting things back on track. The answers are not in the manual, Mohrig, or the internet, they are in understanding what is happening on the bench before you.

*I hope you enjoy the experiments and the hands-on learning they provide!*