

ORGANIC CHEMISTRY LABORATORY SYLLABUS, CHEM 302, Fall 2006

INSTRUCTORS

Dr. Owen McDougal Office Hours*: MWF 10:00 am-12:00 pm or by drop-in / appointment
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Dr. Mike McCormick Office Hours*: M3:00-4:00 pm, W1:00-3:00 pm or by drop-in/appointment
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*Occasional committee meetings may require some changes in the scheduled times. Other times may be arranged on an individual basis. In addition, we are generally available whenever our office doors are open.

MATERIALS REQUIRED. *Laboratory Guide and Manual for Organic Chemistry*, Revised 2001 by E. R. Matjeka, and *Student Laboratory Research Notebook* by Jones & Bartlett Publishers (ISBN 0-7637-0516-0) or equivalent. **Goggles or safety glasses are required and are available for purchase from the bookstore.** Contact lens wearers must also wear safety glasses or, preferably, goggles. Experiment materials will be available for downloading from Course Documents on the Blackboard course web site (see below).

BLACKBOARD. <blackboard.boisestate.edu> This course will utilize the course management program *Blackboard* (Bb) to make announcements, send email, provide course materials, post corrections, post exam results, make assignments and take care of course details. You should make it a habit to check in periodically for updates. Failure to do so could result in missed information, assignments and credit. Blackboard will also be used for email communication. **You must provide and maintain a current email address in blackboard.** Failure to do so could result in missed information, assignments and credit.

Please take the time to update your Blackboard profile and provide a current, working email address.

What should be in a prelab?

The title of the experiment, your name and the date.

A few sentences describing the experimental purpose and methods.

The balanced chemical equation, if the experiment involves a chemical reaction. Include the structures of the molecules that are reacting and produced in the equation, solvents, and experimental conditions.

A reagent table which includes appropriate physical properties of all reactants and products. This would normally include the reagent's name, structure, molecular formula, molecular weight, the melting point of solids and liquids, the boiling point and densities of liquids, water solubility, and any hazards.

A step by step procedure.

Optional (highly recommended): A flow diagram for all experimental operations.

Note: Prelab must be completed before beginning the experiment.

What should I write during the lab?

Think of your lab notebook as a journal. Every time you do something, make a note of it. This includes recording volumes, weights, etc., but it should also include procedural changes. Even if you are following the procedure from a book, write down exactly what you did. Someone else should be able to repeat your experiment using only your notebook record.

The notebook must be complete and legible. If you want to write something over, draw a line through the original information, rather than writing over the original, which usually makes an illegible mess.

SUBMISSION OF LABORATORY REPORTS.

- Come to the laboratory prepared. If the pre-lab write-up is not completed prior to lab, you will be penalized 10% for that experiment in addition to the loss of credit for the incomplete portions.
 - The *Title*, *Physical Constants Table*, and *Stoichiometric Information Table* sections of the notebook are due at the beginning of each lab period and will be checked by your instructor at the beginning of each lab. Your lab instructor will initial your prelab as confirmation that it was completed. Make sure you get your lab book checked each week.
 - An *Experimental* outline is also to be ready at the beginning of each lab and is to be initialed by your lab instructor as well. You will receive a $\checkmark+$, \checkmark , or $\checkmark-$ depending on the quality of your prelab.
 - A *Conclusion* will be due to your instructor within 24 hours of completing the lab unless otherwise notified. The *Conclusion* is to be completed in ink in your laboratory notebook unless otherwise notified.
 - An *Experiment Report Form* will be posted on Blackboard for each experiment **after all *Conclusions* for a particular experiment have been submitted.** Once an *Experiment Report Form* has been posted, late *Conclusions* will no longer be accepted.
 - Data submitted in the Experiment Report Forms must be *verbatim ac literatim* as recorded in the notebook. **Any falsification or addition of data will be penalized by a loss of at least twice the assigned value of a question and the penalty will progressively increase with subsequent occurrences.** All work in the Laboratory Notebook, or reported on the Experiment Report Forms, **MUST** be the original work of the submitting student or it will not be accepted.
 - Late submission of *Conclusions* and Experiment Report Forms will result in a 5% loss of credit for each 24 hour period after their due date and time.
 - **All work in the Laboratory Notebook, or reported on the Experiment Report Forms, *MUST* be the original work of the submitting student or it will not be accepted from all collaborating students.**

CODE OF CONDUCT: A learning environment in which all parties are respectful of others is essential, and in addition it is expected that each student will do his or her own work and honestly satisfy the requirements of the course. **All work** (including preparation of assignments and laboratory write-ups) **MUST** be the original work of the submitting student. Copied, plagiarized or shared work, including laboratory notebook preparation, will not be accepted and is grounds for dismissal. You are expected to know and adhere to the Boise State University Student Code of Conduct. The Student Code of Conduct can be found at: <http://www2.boisestate.edu/studentconduct/Student%20Code%20of%20Conduct.htm>

EXPERIMENT GRADE. The experiment grade will be based upon an evaluation of laboratory performance, product or unknown evaluations and evaluation of laboratory reports. Experiment grades will be worth 80% of the final course grade.

Grade: Your final grade will be based on the following:

Lab Reports (14 x 80 points each)	1120 points
Prelab (14 x 10 points)	140 points
Performance/Yield/Purity (14 x 10 points)	140 points
Lab Practical	100 points

Instructor's evaluation of the student's developing skill, attitude, and initiative 150 points (10%)

COURSE SCORE AND GRADE: The course grade will be based upon: the average experiment score (80%), plus the average discussion, participation, performance, and attitude/behavior score (10%), plus the prelab score (10%).

Grading Scale: A = 100-90, B = 89-80, C = 79-70, D = 69-60, F = 59-0.
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TARDINESS. Tardiness to recitation or the lab will result in a 5% loss of experiment credit for each 10 minute increment.

MAKEUP LABS. Make up time will **NOT** be made available for students who do not complete an experiment in the allotted time period. **Each student will be excused for one lab during the semester. You are still responsible for the content of that experiment. If you do every lab for the term, the lowest lab grade will be dropped.** Missing a second lab will result in a loss of credit for that experiment. More than two absences will require documented extenuating circumstances or you will be dropped from the course. Labs may not be made-up in another lab section. Our policy tries to treat everyone as fairly as possible. (A student who misses a Thursday lab, for example, would not have the same opportunity, and be at a disadvantage, to make up that lab since that would be one of the last labs to do that experiment before equipment and reagent change-over occurs.) In addition, we do not have the means, and it is unsafe, to allow multiple make-ups, particularly when it involves going into another lab section. Our lab sections are kept small for both safety and equipment reasons.

WITHDRAWAL OR CHANGE IN CREDIT STANDING IN LECTURE (CHEM 301). Students withdrawing or changing status from CREDIT in CHEM 301 **MUST** withdraw from CHEM 302. **Students withdrawing from the lab MUST check out of lockers, return keys, and clear lab accounts with the stockroom, or a hold will be placed upon their record with the Registrar's Office. You are not completely withdrawn from the lab course until you do so.**

CELL PHONES and BEEPERS are very disruptive in the laboratory. **Turn off, or set to vibration mode, all cell phones and beepers during lab. If you must answer a cell phone or beeper, do not disrupt the class, leave the lab to do so.**

LEARNING OBJECTIVES. Upon successful completion of this course each student will have demonstrated in lab practice and lab reports the ability to:

1. carry out lab procedures, including macroscale, in a safe and more independent manner.
2. use lab equipment, including macroscale, and facilities in an appropriate manner.
3. obtain and dispose of chemicals and materials in an appropriate manner.
4. be conscientious of green chemical concepts and know how to recognize and apply green procedures.
5. use Spartan to conceptualize the physical and chemical properties of reacting molecules
6. properly prepare and maintain a lab notebook.
7. obtain appropriate physical constants from handbooks.
8. take and record experimental observations in a notebook.
9. use theory and experimental observations to solve problems and draw conclusions.
10. properly prepare and submit experiment conclusions in a timely manner.
11. properly prepare and submit experiment reports in a timely manner.
12. continue to properly use and understand lab procedures treated in CHEM301:
 - a. melting points,
 - b. boiling points and refractive indices,
 - c. simple crystallizations,
 - d. simple distillations,
 - e. reflux,
 - f. solvent extractions,
 - g. chromatography,
 - h. IR spectroscopy and
 - i. understand and set up stoichiometry.
13. use and understand:
 - a. macroscale techniques of crystallizations (including mixed solvent), distillations, solvent extractions, and reflux,
 - b. advanced reaction set-ups,
 - c. column chromatography,
 - d. use of rotary evaporators,
 - e. NMR spectroscopy,
 - f. use of heating mantles and variacs,
 - g. overall percent yield calculations,
 - h. concepts of qualitative organic analysis including the preparation of derivatives and use of spectroscopy.
14. understand and more independently set up and carry out syntheses.