Syllabus for Chemistry 2204: Organic Chemistry II Laboratory  
Spring 2017

**Lab meeting times:** Three hours per week. Note that labs WILL meet during the first week of classes.

**Lab meeting locations:** Beury Hall, Rooms 403 and 409

**Required materials:**


**Student Lab Notebook:** Top-bound, duplicate pages, published by Hayden-McNeil (ISBN 978-1-930882-00-3) and available for purchase at the Temple University Bookstore.


**Eye Protection:** Safety glasses or safety goggles that meet the ANSI Z.87.1 1989 requirements are available for purchase at the Temple University Bookstore.

**Course description:** This course is a continuation of Chemistry 2203. It is offered in the Fall and Spring semesters and in Summer Sessions I and II. Organic II Chemistry Lab places an emphasis on preparation, purification, and analysis, including multi-step sequences, of typical moderately complicated organic compounds. The student will learn experimental techniques in organic chemistry while working with small amounts of materials.

Pre-requisite: Organic Chemistry 2203 with a C- or better. Students without this pre-requisite will be de-enrolled from the course.

Co-requisite: Chemistry 2202 - Organic Chemistry II Lecture. You must register for the lecture course if you are taking the lab course for the first time.

**Course objectives:** Upon completion of this laboratory course, it is expected that students will have learned to

- Use computer based molecular modeling programs.
- Work safely in the laboratory.
- Maintain a laboratory notebook.
- Learn basic laboratory techniques such as extraction, recrystallization, reflux, fractional distillation, and gas chromatography.
- Work effectively with small amounts of material.

**Coordinator:** Dr. Cristina Tettamanzi

Office: Beury 444
Phone: 215-204-2385
E-mail: cristina.tettamanzi@temple.edu
Office hours: Dr. Tettamanzi’s office hours are Tuesday, 10:00-11:00 AM, Wednesday, 12:00 AM-1:30 PM, and Thursday, 1:00-2:30 PM, or by appointment (which is best arranged by e-mail). Please see Dr. Tettamanzi regarding scheduling, adds/drops, and any general lab issues.

Lab Instructors: Each lab section will be under the direction of a lab instructor, either a graduate student TA, an adjunct faculty member, or the lab coordinator. The instructors will provide a pre-lab lecture each week as well as assistance and advice during the course of each experiment. The instructors will monitor pre-lab notebook preparations, grade lab reports, and enforce the departmental and University safety guidelines. Finally, the instructors will schedule office hours each week for help with pre-labs and/or lab reports.

Course policies

Academic integrity: Integrity is a crucial part of the academic experience, and students are expected to adhere to the highest standards of academic honesty. Collaboration and discussion are encouraged, but you are responsible for writing your own lab reports, in your own words. You are expected to work independently on exams and quizzes. Cheating of any kind will not be tolerated and will result in a score of zero on the assignment(s) in question, and/or a failing grade in the course. Please read carefully the Academic Integrity document posted on Blackboard and the Student Code of Conduct for more information: http://policies.temple.edu/getdoc.asp?policy_no=03.70.12

Attendance: Students are expected to attend all laboratory meetings, to arrive on time, and to be prepared to perform the scheduled experiment. Students are required to attend their registered laboratory section at the scheduled time. If you arrive more than 15 minutes late, you may not be admitted. Please inform both your lab instructor and the lab coordinator of any attendance issues as soon as possible.

NOTE: Due to the experimental nature of this course, it is essential that students are present for each lab meeting. A missed lab imposes a much more significant limitation on student learning than a missed lecture (although you should attend all lectures as well!). One lab comprises a larger percentage of the overall course than one lecture, and there is simply no way to replace the hands-on learning experience. Completing a lab report with borrowed experimental data, for instance, offers substantially diminished educational value.

Make-up Policy: Make-up labs and/or make-up lab quizzes will be granted under a very limited and specific set of circumstances only. Otherwise, score of zero will be recorded for any missed labs or quizzes. Student athletes and other students with legitimate absences will be accommodated only if the planned absence is brought to the attention of the lab coordinator well in advance (at least one week). Please see the posted document (Blackboard) “Chem 2203/2204 Make-Up Policy” for more details.

Blackboard: You are responsible for the information posted on the Blackboard course site. Course documents such as the syllabus, safety guidelines, lab notebook and report guidelines, and supplemental laboratory experiment information will be posted on Blackboard. Any general course announcements will also be posted on Blackboard.

Laboratory: Before coming to lab, students are required to have done the following:

- Dress appropriately in accordance with safety guidelines
• Bring safety glasses or goggles that are in accordance with the specified regulations
• Read the introduction, procedure, and any other relevant sections of the textbook or supplemental materials for the experiment to be performed
• Construct an appropriate pre-lab write-up in your laboratory notebook
• Completed the pre-lab quiz on Blackboard
• Completed the lab report for the previous week’s experiment, to be handed in to your lab instructor at the beginning of the lab period

**Laboratory Safety:** Students are required to conduct themselves in a professional and safe manner at all times. Failure to do so will result in immediate dismissal from the lab. In order to comply with Federal laws and regulations, students are required to dress appropriately for lab and wear specified personal protective equipment. *Students who come to lab without safety glasses or dressed improperly will not be permitted to work in the lab.*

• All students MUST wear a pair of ANSI Z87.1 approved safety glasses or goggles the entire time they are in the laboratory. It is your responsibility to bring them to lab as “loaners” are not available.
• Long pants MUST be worn. Shorts and skirts are not permitted in the lab at any time. Arms should be covered to the elbow and midriffs should not be exposed. A full-length lab coat or apron must be worn for most experiments (provided in lab).
• Shoes that cover the entire foot should be worn. Sandals, clogs, open-top, or open-toe shoes are not permitted in the lab at any time.

Lab safety guidelines will be discussed in more detail during the first lab meeting, and relevant information will be stressed before each experiment. You are required to complete a safety quiz by the end of the second week of classes. For more specific information, please read carefully the Lab Safety and Waste Disposal documents posted on Blackboard.

**Chemical Hygiene:** Neatness and cleanliness are important components of laboratory safety. You are responsible for the cleanliness of your work area. The entire lab section is responsible for the cleanliness of the entire lab (balances, sinks, fume hoods, etc.). Lab grades of individuals or the entire class may be lowered if issues with cleanliness are consistently observed. For more specific information, please read carefully the Chemistry Lab Best Practices document posted on Blackboard.

**Electronic Devices:** The use of graphing and/or programmable calculators, PDAs, and cell phones is strictly prohibited when taking quizzes and exams.

**Withdrawals:** A withdrawal is an institutional procedure that is not complete until the withdrawal form has been signed and submitted to the Registrar’s office. Details of the Temple University Policy (#02.10.14) on Withdrawal may be found at http://policies.temple.edu/getdoc.asp?policy_no=02.10.14.

**Incompletes:** An incomplete is only given in accordance with institutional procedures. An incomplete will not be assigned until the specific requirements are met (an incomplete is NOT a means to circumvent course policies for make-up labs and lab report due dates) and the appropriate forms have been signed and approved by the Dean’s Office. Details of the Temple University Policy (#03.12.13) on Withdrawal may be found at http://policies.temple.edu/getdoc.asp?policy_no=02.10.13. Note that even if the specific requirements are
met, assignment of an incomplete in this laboratory course is severely limited by the fact that performing make-up labs in future lab sections is NOT a viable option.

Disability Resources and Services: Students who think they may need accommodations in this course due to the impact of a learning, physical, or psychological disability are encouraged to meet with Dr. Tettamanzi privately early in the semester to discuss their concerns. In addition, students must contact Disability Resources and Services (DRS) in 100 Ritter Annex (215-204-1280) as soon as possible to verify their eligibility for reasonable academic accommodations. Early contact will help to avoid unnecessary inconvenience and delays.

Assignments and exams:
Reading: Assigned reading from the laboratory textbook and/or supplemental materials shown in the lab schedule must be completed before the beginning of each lab period. Please consult Blackboard for additional information while preparing for each experiment. To ensure a safe and productive lab experience, it is critical that students read and understand the manipulations that will be performed before beginning an experiment.

Pre-Labs: In addition to reading carefully the experiment, your pre-lab preparations will include taking a quiz and entering a pre-lab write-up in your laboratory notebook. See the following two sections for more details.

Lab Notebooks: Each student must bring a suitable notebook to lab each week. You will prepare a pre-lab section in your notebook for each experiment and record data and observations during each experiment. You will hand in a copy of your completed notebook pages each week, and your lab instructor may ask to review your lab notebook at any time. See the Lab Notebooks document in Blackboard for more information.

Lab Reports (Post-Labs): For general guidelines and a sample template, please read carefully the Lab Report Format and Sample Lab Report documents posted on Blackboard. Specific instructions for the lab report required for each experiment will be available on Blackboard. Lab reports are due one week after an experiment is completed, at the beginning of the next lab period. After that time, a penalty of 5 points will be deducted from your score for each 24-hour period (including weekends), or portion thereof, that the report is late (so, starting from the beginning of your lab period, until 24 hours later, 5 points will be deducted, etc.). Late lab reports should be delivered directly to your instructor. If you are unable to deliver the report directly and leave it in a mailbox or under an office door, then you must notify your instructor of this circumstance, but you are responsible should the report be lost or delayed. Do not assume that your TA will check their mailbox regularly. In calculating your final grade, the lowest lab report score (including any zero) will be dropped. You are responsible for adhering to all academic integrity policies of this course when writing lab reports.

When is the lab report due in case of a missed lab?: If you do not attend a lab period or are approved for a make-up lab, your lab report is still due as scheduled (an extension is not automatically granted for a missed lab). Options for submitting on time include scanning and emailing to your instructor, or asking a fellow student to hand it in. Any requests for an extension must be made directly to the lab coordinator and must include appropriate documentation.
Quizzes: Pre-lab quizzes will be set up on Blackboard. There will be a quiz each week with the exception of the first week of the semester (lab orientation). A separate Safety Quiz will be posted and must be completed by the beginning of Week 3 (when you will run your second experiment). **You must complete each pre-lab quiz before the beginning of your lab section.** There are no make-up quizzes, so failure to complete a quiz on time will result in a score of zero. If the pre-lab quiz is not completed before the lab meeting, the lab instructor, in consultation with the lab coordinator, will determine if the student is adequately prepared to perform the experiment. In calculating your final grade, the lowest quiz score (including any zero) will be dropped. You are responsible for adhering to all academic integrity policies of this course when taking Blackboard quizzes.

*Note that the quiz policy in this course is different than in general chemistry. **Treat the Blackboard quizzes as if you were taking them in lab, in other words, as if you had only one chance.** While you are permitted two attempts to complete each quiz on Blackboard, the second attempt is intended to be used only in the case of technical difficulties, and NOT to improve your score after practicing with the first attempt. **The first graded quiz score recorded in Blackboard will count as your grade for that quiz.**

Final Exam: A lab final exam will be given on the last scheduled meeting of a student’s lab section. This exam is intended to assess your comprehensive knowledge of the experiments performed throughout the semester.

**Grading:** There will be a total of 726 points possible. The breakdown is as follows:

- Lab Reports (40 points each, 11 of 12) = 440 points (60.6%)
- Quizzes (10 points each, 12 of 13) = 120 points (16.5%)
- Final comprehensive exam = 100 points (13.8%)
- Lab Notebook (4 points each, 11 of 12) = 44 points (6.1%)
- Technique (2 points each, 11 of 12) = 22 points (3.0%)

**Make-up policy:** Make-up labs and/or make-up lab quizzes will be granted under a very limited and specific set of circumstances only. See page 2 and the posted document (Blackboard) “Chem 2203/2204 Make-Up Policy” for additional information.
**Tentative Lab schedule:** With the exception of the first week of classes, **the lab week runs from Tuesday - Monday.** The first day of each lab cycle is a Tuesday, and the experiment continues through the following Monday.

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<th>Experiment</th>
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<td>Dr. Martin Luther King, Jr. Day – No Labs</td>
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<td>17-23</td>
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<td>24-30</td>
<td>Diels-Alder Reaction: 9,10-Dihydroanthracene-9,10-α,β-succinic Acid Anhydride</td>
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<td>Electrophilic Aromatic Substitution Part 1: 4-Bromoacetanilide. IR and $^1$H NMR Spectra Review</td>
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<td>7-13</td>
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<td>28-Mar. 6</td>
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<td>21-27</td>
<td>Imide Synthesis: N-Phenylmaleimide</td>
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<td>Nucleophilic Aromatic Substitution: 2,4-Dinitrophenylthiocyanate</td>
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*Monday, March 20 is the first Monday after Spring Break*