

# NEW YORK UNIVERSITY

Department of Chemistry

Fall 2016

## CHEM-UA 226 ORGANIC CHEMISTRY II LABORATORY

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### Office Hours:

Instructor office hours are posted on the NYU Classes website. You may attend all instructors' office hours, not only the instructor of your laboratory section. Office hours will be held in Silver 1001D (10<sup>th</sup> floor) unless otherwise noted on NYU Classes.

### Course Materials:

Required Textbook: *Experimental Organic Chemistry: A Miniscale and Microscale Approach, 5<sup>th</sup> Edition*, John C. Gilbert, Stephen F. Martin, Cengage Learning, 2011, ISBN 1439049149 (referred to hereafter as G&M)\*

Required Notebook: *Student Lab Notebook, Organic Chemistry, 100 Carbonless Duplicate Sets*, Hayden McNeil, ISBN 978-1-930882-46-1\*

Required Laboratory Equipment (commonly referred to Personal Protective Equipment, or PPE): Laboratory safety goggles\*, 12 disposable laboratory coats\*\*, 1 box of disposable gloves\*\*

\* *May be purchased at NYU bookstore*

\*\**May be purchased at the stockroom, located in the organic teaching laboratory*

## **I. Course Description**

This course is intended to introduce you to major concepts and techniques in organic chemistry through laboratory experiments. The Organic Chemistry II Laboratory course will provide training in the techniques of the organic chemistry laboratory, such as carrying out chemical reactions and purification of chemical mixtures. Purification methods such as recrystallization, extraction, distillation, and column chromatography will be utilized. Chemical identification and purity will be determined by assessing data from methods such as chemical tests, thin-layer chromatography (TLC), gas chromatography (GC), mass spectrometry (MS), nuclear magnetic resonance (NMR) spectroscopy, and infrared (IR) spectroscopy. Expanding your knowledge base and critical thinking skills will help you to prepare for a wide array of potential future challenges, including the upper level courses, organic requirements for medical schools, and independent research.

## **II. Contacts and Interactions**

### ***II-i. Email Communications for Specialized Inquiries***

You will have the opportunity to interact with the section instructor and course instructor on record in person on a regular basis in the laboratory; use these opportunities to get answers to your questions when possible. If you must email, your primary contact is your laboratory section instructor. All inquiries regarding grading, policies, absences, and any other issue should begin by contacting your section instructor and they will answer your e-mail within a 48-hour period.

**ALL email correspondences for this course MUST begin with a list of the following:**

- 1) Your Name**
- 2) Section #**
- 3) Laboratory Section Day and Time**
- 4) Lab Section Instructor**

Also, include the word “**organic**” (not “orgo,” not “chem lab,” etc) somewhere in your subject line. Additional descriptive words in the subject line may be included, but the specific word “organic” will be used to retrieve potentially buried course emails.

The course instructor of record (Professor Tosovska) should only be contacted via email *after* you have e-mail verification that your section instructor has ruled on the matter. Students wishing to meet with the course instructor must provide information regarding prior discussions with their section instructor and explain why the section instructor’s ruling is unsatisfactory. When contacting the course instructor via email, you **MUST** include (1) **ALL** of the identification information described above **AND** (2) the correspondence(s) with your section instructor. If all or parts of this are missing, the course instructor may not answer your e-mail.

### ***II-ii. NYU Classes Communications***

General inquiries on topics such as laboratory rules, procedures, experimental details for a specific laboratory experiment should be posted on the “Forum” section of NYU Classes. Postings will be addressed by an instructor and will be visible to all students. You are required to monitor to “Forum” as well as the “Announcements” section of NYU Classes laboratory site.

### ***II-iii. Instructor Office Hours***

As mentioned above, instructor office hours are posted on the NYU Classes website. You may attend all instructors' office hours, not only the instructor of your laboratory section. Office hours will be held in Silver 1001D (10<sup>th</sup> floor) unless otherwise noted on NYU Classes. *Also use extra laboratory time to ask questions and discuss course materials with the instructors.*

### ***II-iv. General Comments on Contacts and Interactions***

Office hours, meetings with instructors, and e-mail/NYU Classes communications are limited to the workweek. No correspondence of any type should be expected from any instructor on weekends and university holidays. If you follow the instructions above but do not receive an instructor response to your inquiry via email or NYU Classes within what you consider to be a reasonable amount of time, please re-send the email including the original message.

## **III. Safety**

The safety of you and your colleagues is our highest priority. For the laboratory to be safe, all of the occupants must be aware of procedures, policies, and hazards associated with each experiment. Students should be familiar with of the location and operating procedures for all laboratory exits and safety related equipment (e.g. safety shower, eye-wash, fire blankets, fire extinguishers, emergency phones). Other chemistry faculty might visit the laboratory without notice and are allowed to enforce laboratory safety rules at any time.

### ***III-i. Experiment Preparation and Prompt Arrival***

To operate safely in the laboratory you must be prepared. Students must arrive at the laboratory thoroughly prepared for the experiment, including a properly prepared laboratory notebook. Students that are unprepared for a laboratory experiment are a safety risk and will be removed from the laboratory, receiving a "0" for that experiment. The laboratory lecture is an integral part of the preparation for an experiment at which time safety instructions might be explained to you. Therefore, students arriving to laboratory more than 20 minutes late or during/after the laboratory lecture will not be admitted, receiving a "0" for that experiment. Students who are 5-20 minutes late more than once may not be allowed to carry out the experiment.

### ***III-ii. REQUIRED Personal Protective Equipment (PPE)***

1) **Safety goggles** must be properly worn at all times by all occupants of the laboratory, even if you are not working with chemicals, otherwise you will be removed from the laboratory and not permitted to compete the experiment. Goggles can be purchased from the NYU bookstore.

2) **Protective gloves** must be worn at all times in the laboratory. You may purchase a box of 100 disposable nitrile gloves from the stockroom in the organic teaching laboratory and/or a pair of rubber gloves from the bookstore. We recommend purchasing both the nitrile gloves (for everyday lab use) and the rubber gloves (when needed). Nitrile gloves, while more comfortable to wear, will not protect you well against halogenated solvents such as dichloromethane. Latex-based gloves are NOT allowed. While wearing gloves, do not touch areas that are commonly touched without gloves (e.g. door knobs, staplers).

3) **Laboratory coats** must be worn at all times in the laboratory. You may purchase a set of 12 lab coats from the stockroom in the organic teaching laboratory.

The three PPE items listed above (safety goggles, protective gloves, and laboratory coats) are for LABORATORY USE ONLY. Do NOT wear these items outside of the laboratory even if you think they are clean.

4) **Clothing that covers your legs** must be worn at all times in the laboratory.

5) **Closed shoes** (no part of your foot is exposed) must be worn at all times in the laboratory.

### ***III-iii. Basic Laboratory Rules***

- 1) No food or drinks are allowed in the laboratory.
- 2) No cell phone usage is allowed in the laboratory.
- 3) No personal items such as coats, backpacks, etc. are allowed in the laboratory at any time. Please plan accordingly. Note that general lockers are available on the 4<sup>th</sup> floor of Silver to store your personal belongings BEFORE you enter the laboratory. These lockers are on a 5-hour timer, i.e. they will open automatically after 5 hours. A limited number of non-electronic lockers (for use with personal locks) are available on the 4<sup>th</sup> and 5<sup>th</sup> floors of Silver. Personal items left in these lockers for more than 5 hours will be donated to charities.

### ***III-iv. Chemical/Glassware Handling and Spills***

- 1) Treat all chemicals with caution.
- 2) Waste must be disposed in appropriate waste bottles. When in doubt, ask where to dispose of chemicals. NO chemicals may be disposed of down any drain. Note that there are (a) trash cans for paper and lab coat disposal, (b) barrels with lids for gloves and glass waste disposal, (c) containers in the waste hoods for solid chemical waste disposal, and (d) labeled bottles for specific liquid waste disposal.
- 3) Read the Fire/Injury Instructions located on the columns in the laboratory.
- 4) Alert the instructor if there is a spill. Never leave any spill or trash (contaminated or not) at a balance, in your hood, or any other place in the lab.
- 5) If you accidentally over-dispense a chemical, dispose of it in the proper waste container. NEVER return chemicals to the bulk container.
- 6) Do not transport an unstopped flask out of the fume hood.
- 7) Do not raise the fume hood sash above the recommended level (half way up).
- 8) Never use glassware or laboratory equipment if it appears to be broken. Report all broken communal items to your instructor and replace all broken personal items immediately.

### ***III-v. Illness, Injury, and Physical Conditions [medical/health considerations]***

If you are not feeling well or are injured while in the laboratory, inform the instructor immediately. The course of action will be dependent on the nature of the event. We recommend that, at the very least, any student who experiences illness or injury during a laboratory session is seen by NYU Health Services.

If you are experiencing any physical condition that could affect your ability to function safely in the laboratory (i.e., pregnancy, medical conditions), inform the course instructor immediately.

## **IV. Grading and Requirements:**

You will receive a single grade for the combined organic chemistry lecture and laboratory courses. The laboratory portion contributes to 25% of the overall organic chemistry course grade. There are 11 laboratory sessions during which experimentation will take place in the laboratory, plus a final exam laboratory sessions. Your final grade will be based on your (1) average quiz grade, (2) 9 of 11 highest weekly combined notebook + technique + report/post lab assignment grades, and (4) written and practical final exam grade. You must complete at least 70% of the experiments and associated work (8 of the 11 laboratory experiments) as well as both portions of the final exam in order to be eligible to receive a passing grade for the course. For logistical reasons it is NOT possible to offer make-up laboratory sessions. Therefore, **there will be NO makeup laboratory sessions for any reason.**

Pre-lab quiz	15%
Notebook	5%
Safety/Technique/Results	20%
Laboratory Reports	30%
Final Exams	30%

If you do not take the final exams, they will be graded as “0” points unless you provide a valid notice from the Dean’s office. This notice must be submitted to the course instructor of record (not to the section instructor) within 3 days of the missed exam. For students that have a valid excuse for missing a final exam, ONE make up exam will be offered.

**Exam dates:** Practical (in-lab) final Dec 8 (for Thursday lab) and Dec 9 (for Friday lab)

Written final Dec 15 (for Thursday lab) and Dec 16 (for Friday lab)

#### ***IV-i. Prelab Quiz***

As a way of preparing for each experiment, you should arrive at the laboratory prepared to take a quiz each week. Quizzes will take place in the laboratory, for a specified amount of time, typically at the beginning of the session. If you arrive late to the laboratory session while a quiz is being taken, you may take the quiz but you must stop at the same time as everyone else. If you arrive after the quiz has been taken, you may not take the quiz, and you will receive a score of “0” for that quiz. No resources may be used during the quiz. *Anyone caught in possession of any type of resource that may potentially aid them or others in taking a quiz (e.g. handouts, any electronic device that is visible to an instructor, calculators, notebooks, etc) will receive a “0” for all graded components of the experiment and will be required to leave the laboratory. Cheating is a direct violation of NYU’s policies and will be dealt with accordingly (See Syllabus section “V. Academic Honesty”).* Quiz content will be based on the assigned reading/handouts for the upcoming experiment (i.e. the experiment that you will be performing that day) unless otherwise announced by the course instructor. The quiz will cover information related to the experiment, including but not limited to theory, background, and experimental procedure. A typical quiz will have 3-6 multiple-choice, multiple answer, or short answer questions. Note that (1) you will not have a quiz for every experiment, and (2) not all quizzes will be the same, even for the same experiment.

#### ***IV-ii. Notebook***

All students should see the Notebook Guidelines document that is posted on the NYU Classes website. A laboratory notebook (*Student Lab Notebook, Organic Chemistry, 100 Carbonless Duplicate Sets*, Hayden McNeil) can be purchased from the NYU bookstore. Please note that a student who does not use the assigned notebook with carbonless duplicate pages will receive a “0” for the notebook part of the grade. Your notebook is a tool to help you prepare for the experiment and to record your observations during the lab period. If the laboratory notebook has not been prepared prior to arrival at laboratory, the student will be removed from the laboratory as a safety risk. Your notebook will serve as your only source of information in conducting the experiment. **You may not bring the textbook, handouts, or any other source of information into the laboratory unless approved by the course instructor.** Instructors may check notebooks at any time. At the end of the laboratory session, you must give your section instructor the carbon copy of your entry; notebook carbon copies will not be accepted after the student leaves the laboratory.

#### ***IV-iii. Safety/Technique/Results***

Incidents that reduce the level of your safety or the safety of those around you will lower your score (e.g. see section “III. Safety”). Severe penalties will be incurred for senseless negligence, which has no place in a chemical laboratory. For example, leaving any type of chemical or waste in personal or common areas, or failure to leave your common glassware clean and organized condition is unacceptable. If communal areas are broadly abused, the instructors may apply a penalty to all students in the lab; encourage your peers to clean up after themselves.

You will be assessed for your technique during each laboratory period. Improper use of laboratory equipment, materials, or chemicals (including over dispensing) will lead to point deductions. During the laboratory lecture (the first 10-20 minutes), important laboratory related information may be distributed. You are expected to pay attention and take notes during the laboratory lecture. All materials discussed during the laboratory lecture should be familiar to you after the lab lecture, i.e. if you do not know the contents of the lab lecture, you will receive a grade of “0” for the technique part for the experiment. Your understanding of the experiment and laboratory safety will be evaluated every laboratory period by your instructor. Your answers to questions will be part of your technique grade. If the instructor views you as unprepared to undertake the laboratory experiment for the week, they will remove you from the laboratory and you will receive “0” points for the experiment.

You will not be allowed to leave the laboratory until all personal and communal work areas/glassware are in satisfactory condition. If a balance or piece of glassware is dirty/broken/missing/etc upon your arrival, inform an instructor immediately. They will help to rectify the situation and penalize the person who left the item in poor condition. However, doing nothing to resolve the situation is unacceptable. Ultimately you are responsible for leaving the space in good condition when you leave the laboratory and failure to do so will result in point deductions. Your section instructor will often check that your laboratory locker is locked at the end of each lab period. If you leave the lab with your locker door ajar/unlocked, you will be docked points. This is for your own protection.

In some cases your experimental results (e.g. product purity, percent yield) will contribute to this portion of the grade.

Your Safety/Technique/Results grade will be available to you upon your request to your section instructor at the end of the weekly lab session or at the following session. After one week, these grades may not be disputed.

#### ***IV-iv. Laboratory Reports/Postlab Assignments***

##### General Information.

All students should see the ‘Report/Postlab Assignment Advice’ document that is posted on the NYU Classes website. For each experiment either a Report or Postlab Assignment will be assigned. Both Reports and Postlab Assignments must be fully electronic (no hand written text/drawings). All chemical structures must be generated with the ChemDraw program (available for download via the library website).

### Due Dates and Submission Requirements.

Reports and Postlab Assignments are due **9am** of the laboratory session one week after the experiment is performed. **Reports/Postlab Assignments must be uploaded to NYU Classes as a PDF file (using “Turnitin”).** Make sure your PDF file has been uploaded before the laboratory session starts when the report is due, otherwise the report will be late. Late reports will incur a 25% point deduction if turned within 24 hours after of the assignment due date/time. Assignment submission beyond 24 hours after the original deadline will result in a score of “0.”

If you are absent from any laboratory session for any reason, the previous week’s assignment is still due one week after the experiment was performed.

### Turnitin.

When you submit your report to ‘Turnitin’ (via the link on NYU Classes, under the assignment tab) you should immediately receive a conformation email receipt. It is your responsibility to make sure you receive and save this conformation. If you do not receive an email conformation indicating successful upload of the assignment to Turnitin, email a copy of your report to your **section instructor** prior to the time the assignment is due, otherwise the assignment may be counted as late. It is not required but sometimes helpful if your file names are descriptive, such as ‘Last Name-First Name-Exp Number’ (e.g. Curie-Marie-Exp 1).

### ***IV-v. Re-grade for Any Evaluation Component***

**For re-grading of any type of course assessment, you must submit a Re-grade Form within one week after the grade is available to you.** The Re-grade Form on the Laboratory NYU Classes website should be used. Do NOT make any marks on assignment/quiz/exam/report (any marks directly invalidate any materials for re-grading). Note that we will occasionally copy student work in order to minimize the temptation to falsify claims. *Cheating is a direct violation of NYU’s policies and will be dealt with accordingly (See section “V. Academic Honesty”).* **You must include a detailed written statement addressing why something should be re-graded, i.e. a statement such as ‘re-grade question 2’ is not acceptable.** Tell us why you think your answer/report/performance deserves more points. While instructors can provide insight into errors made on a laboratory work, instructors are strictly forbidden to make any grade changes during a personal encounter. Re-grades are strictly done by the written request process to ensure objectivity. **Re-grade requests should first be submitted to your laboratory section instructor for consideration.** Cases that cannot be resolved between the student and the section instructor, with both parties approval, should be transferred to the laboratory course instructor of record for review. In this case a detailed description of why a resolution between the student and the section instructor was not satisfactory must be included with the re-grade form.

## **V. Academic Honesty**

It is expected that all students are aware of their responsibilities not to cheat. ‘Teamwork’ is NOT allowed during the prelab quizzes, writing of reports/postlab assignments, or exams. Work in the lab is to be carried out independently, unless otherwise instructed by the course instructor of record. No one in the laboratory course has a laboratory partner. Therefore, you should NEVER use another student’s results as if they are your own; this is considered cheating. Each

student must carry out his/her own experiment. You may be directed to share data during selected collaborative projects but this will be at the explicit instruction of the course instructor of record and all sources of data must be cited. ANY unauthorized data sharing will be penalized, at minimum, by a score of “0” for all graded components of the experiment. *Cheating off of another person’s work is unethical, unacceptable, and is a direct violation of NYU’s policies, and will be dealt with accordingly. Falsifying work (for example before turning it in for a re-grade) is cheating and will be reported.* Note that we will occasionally copy student work in order to minimize the temptation to falsify claims. ***A major problem in the organic laboratory course is plagiarism.*** Plagiarism is to steal someone else’s ideas, words, or figures and use them as your own. That means that you cannot use current or old reports, data, figures (such as ChemDraw figures), etc from your friend, labmate, roommate, internet, commercial report-writing websites etc. Submission of any previous semester course materials or any material/resources available through the internet is NOT allowed for this course. Even taking a single sentence from another source is plagiarism and will be viewed as such. We are fully aware that old reports are available on the web. You are NOT allowed to collaborate on the laboratory reports with anyone inside or outside of the course. This includes (but is not limited to) that you cannot exchange ChemDraw figures, Excel figures, etc. The transfer of any file between any two parties, and subsequent submission of its contents, in full or in part, for a grade is considered plagiarism. Make sure you are NOT using these prohibited resources but instead hand in a laboratory report that is solely based on your data, thoughts, and writing.

As discussed in section “IV-iv. Laboratory Reports/Postlab Assignments,” all students are required to upload each laboratory report to Turnitin as a PDF file. Note that Turnitin will automatically scan each report for overlap with any other report ever submitted to Turnitin as well as resources on the web (Turnitin scans not only for overlap in writing but also figures, tables and schemes), i.e. we WILL recognize if you cheated or plagiarized.

***If we recognize that you plagiarized anywhere in your coursework there will be a stiff penalty that is non-negotiable.*** The *first time* you hand in a plagiarized work, you will receive a “0” for ALL grades related to the experiment for which the report containing plagiarism was handed in, and it WILL be counted as one of the scores that determines your final grade. View this as a stiff warning. If you hand in a plagiarized report for the second time, you (1) will receive an automatic “0” for the entire laboratory part of your organic course grade and (2) will not be allowed to continue with the organic laboratory for the rest of the semester. That is a “0” for the WHOLE semester not just for the one laboratory session. Note that if Turnitin recognizes that students worked together on laboratory reports or used the same internet source, etc., (i.e. it recognizes an overlap between two or more laboratory reports, or recognizes that a laboratory report is copied from the internet or an old laboratory report) it alerts us to which laboratory reports have notable overlap and flags these reports. ***Each student*** whose laboratory report is flagged will be penalized ***INDEPENDENTLY*** regardless of whether you are actually the student that copied the laboratory report or the student that allowed copying from his/her laboratory report (both offenses are considered cheating).

Any student who violates the “academic honesty” clause will be reported to the Dean’s office, no exceptions, and a recommendation will be made to the dean’s office that the violation result in a permanent note in the student’s record.

## **VI. Additional Miscellaneous Notes**

- 1) Experiments are correlated to the lecture concepts when possible. You are responsible for all relevant theory covered in lecture.
- 2) In an effort to correlate the lecture and laboratory topics, experiments will be announced approximate 7 days in advance. This will allow for our ability to adjust the experiment order to best match the variable pace of the lectures. That being said, the laboratory can be a great place to introduce certain new concepts. Therefore, you should not be surprised if you find yourself learning new “lecture-type” concept for the first time in the laboratory setting.
- 3) Each section in G&M ends with a set of exercises; it is in your best interest to work on these problems. Certain exercises may be announced for you to address formally in your written report/postlab assignment.
- 4) **For each experiment, check the NYU Classes laboratory website for additional handouts. In case of conflict, instructions on the handouts supersede those written in the textbook.**
- 5) Student who are approved by the Moses Center for special accommodations and would like to utilize them must provide written documentation to the instructor of record for the course at least 5 business days in advance of the event for which the accommodation is requested.
- 6) As science, technology, and pedagogy are constantly evolving, the instructor of record reserves the right to modify the syllabus or experiment schedule in an effort to offer NYU students the highest quality laboratory experience possible.