

Chem 29a: Organic Chemistry I Laboratory

Contact Details

Stephanie Murray

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I will make every attempt to answer emails in a timely manner (24-48 hours). My working hours during summer school are Tuesday – Thursday 8:30 am – 5:30 pm and Fridays 8:30 am – 12:00 am. Emails received outside my working hours may not be responded to until the following working day. Emails about assignments received on the due date may not receive a response. Please allow a minimum of 24 hours in advance with questions about any assignments. Please use your official Brandeis University email account for all communication in this course.

Meeting Times

Lab Sessions

Tuesday & Thursday 1:00 PM – 5:30 PM EST, SSC 00-08

Lab will also be held on Wednesday, July 5

Instructor's Office Hours

Tuesday, Wednesday, Thursday 11:30 AM – 12:30 PM EST, SSC 00-08b

Appointments at other times may be available. Email Prof. Murray if you need to schedule an appointment.

Lab TA Office Hours

Available on LATTE after first lab session.

Course Description

The CHEM 29a laboratory course presents approaches for the isolation and analysis of organic compounds. Various techniques are introduced, including extraction, distillation, chromatography, and crystallization. An emphasis is placed on structure determination through use of spectroscopic methods, as well as written scientific communication.

Learning Goals:

- Interpret spectroscopic data in order to determine chemical structure
- Evaluate methods for purification and separation of organic compounds
- Connect textbook reactions with practical laboratory techniques
- Understand organic chemistry in the context of scientific literature
- Develop scientific communication skills through lab reports and presentations

Prerequisites

Prerequisite: A satisfactory grade (C- or better) in Chem 18b or Chem 19b or the equivalent. Co-requisite or Prerequisite: Chem 25a. Dropping Chem 25a necessitates written permission from the lab instructor to continue with the lab. May yield half-course credit toward rate of work and graduation. Two semester hour credits.

The table below lists the lab TAs. Their office hour times and locations will be available on LATTE after the first lab session. While you are encouraged to go to your Lab TA's office hours, you may attend those of another TA if needed.

Lab TA	Email
Caroline Vozzo	carolinevozzo@brandeis.edu
Robert Lozniceru	robertlozniceru@brandeis.edu
Mark Shamis	markshamis@brandeis.edu

Course Requirements

Academic Integrity

Every member of the University community is expected to maintain the highest standards of academic integrity. A student shall not submit work that is falsified or is not the result of the student's own effort. **In a lab course this includes presenting data in your lab report that is not your own without properly crediting the source (classmate, TA, etc.) even if you were given permission to use this data. You must obtain explicit permission from your TA or the course instructor to use data other than your own in a lab report. Additionally, using falsified data (i.e., making up data or changing the data obtained during the lab) is considered an academic integrity violation.** Infringement of academic honesty by a student subjects that student to serious penalties, which may include failure on the assignment, failure in the course, suspension from the University or other sanctions (see section 20 of R&R). Please consult Brandeis University Rights and Responsibilities for all policies and procedures related to academic integrity. Students may be required to submit work to TurnItIn.com software to verify originality. A student who is in doubt regarding standards of academic honesty as they apply to a specific course or assignment should consult the faculty member responsible for that course or assignment before submitting the work. Allegations of alleged academic dishonesty will be forwarded to the Department of Student Rights and Community Standards. Citation and research assistance can be found at [Brandeis](#)

Library Guides - Citing Sources

(<https://guides.library.brandeis.edu/c.php?g=301723>).

Required Materials and Software

- ChemDraw software ChemDraw and Chem3D software, found here: <http://www.brandeis.edu/its/services/software-business-systems/software/index.html>. *The use of this software for drawing chemical structures will be required for all laboratory reports.*
- Organic Chemistry Lab Techniques, 2nd ed. by Lisa Nichols, 2017. Available **free of charge** at <http://organiclabtechniques.weebly.com>. Also linked on LATTE.
- Microsoft Office Suite – instructions for installation of Office 365 ProPlus can be found through ITS: <https://www.brandeis.edu/its/services/software-business-systems/software/index.html>
- PDF Scanner App – for converting images to PDFs on a smartphone. There are many to choose from that are available free of charge.
 - Two good examples are Adobe Convert to PDF and GeniusScan.
 - If you are using an iPhone or an iPad, the *Notes* app has an option to convert images to PDFs.
- LATTE is the online course website at Brandeis. All course materials (e.g. course calendar, handouts, videos) will be available on LATTE, as well as class announcements and any schedule changes. LATTE link: <http://latte.brandeis.edu>.
- Compound structures, physical data, spectra, etc. can be found at <http://sigmaaldrich.com>.
- Gradescope will be used to turn in assignments in this course. You can access Gradescope at: <http://gradescope.com>. There are instructions for using Gradescope available on LATTE. Make sure you choose “Login with School Credentials” and use your Brandeis username and password to log in.

If you are having difficulty purchasing course materials (including equipment and other technology needs), please make an appointment with your Student Financial Services or Academic Services advisor to discuss possible funding options and/or textbook alternatives.

Laboratory Preparation and Safety

Prepared students make for a safer and more efficient lab experience. Lab preparation includes familiarizing yourself with techniques relevant to the experiment (assigned chapter readings, videos and any handouts), and completing the prelab. **If your prelab is not complete and properly submitted on time (within the 30-minute late arrival window) you will not be allowed to conduct the experiment and will earn a score of 0 on all assignments associated with that experiment.** Not completing the prelab means you are not properly prepared for lab and will therefore pose a safety hazard to your classmates and TAs.

Required Assignments

All assignments will be turned in via Gradescope unless otherwise specified. You will be enrolled in the appropriate Gradescope course by the course instructor. Carefully read assignment titles and make sure to submit your work to the correct assignment. Work submitted to the wrong assignment may not receive credit or receive a point deduction. Late submissions receive a -5-point deduction for each 24-hour period they are late. Prelab, post lab and notebook all count as individual assignments so if both your post lab and notebook are late, they will each receive the late submission penalty. Due to the pace of summer school, late work is only accepted for 48 hours after the original deadline. Assignments that are still incomplete after this deadline will earn a score of 0.

Lab Lectures – There will be three types of lectures for this course.

Conceptual Prelab Videos – These prelab lectures will focus on the conceptual background behind the experiments. These will be prerecorded videos posted on Echo360 that students are required to watch prior to the relevant experiment as part of their lab preparation. Echo360 tracks whether or not students watch videos as well as how much of the video is watched and I will regularly check these statistics. These prelab lectures will be helpful for completing the prelab assignment for each experiment. The conceptual background of each experiment will be a major component of the final exam.

Technical Prelab Lectures – These prelab lectures will be delivered by your TA at the start of each lab session. They will focus on how to properly conduct the relevant lab techniques for that experiment. It will be assumed in these lectures that you have already watched the conceptual prelab video and you will likely be lost during the lecture if you have not done so.

Spectroscopy Lecture Videos – Spectroscopy is an important component of organic chemistry. A variety of spectroscopic techniques are used to identify organic compounds in this course. This semester we will learn about IR and ^{13}C -NMR spectroscopy. This will be covered in videos posted to Echo360 and problem-solving sessions during two of the lab sessions. The videos will be paced throughout the semester such that, if you follow the schedule, you will learn everything you need in time for each problem-solving session and the final. It is highly recommended that you stick to this schedule (at a minimum, feel free to get ahead if you want to). These lectures will also have questions integrated into them which you are required to complete by July 5 (last day of lab). They are graded for completion, not correctness, and are part of your final course grade. There will be 2 spectroscopy problem solving session during the semester. They will run for the last hour of lab (4:30 – 5:30) on the day they are scheduled. If everyone finishes their experiments before 4:30 we may begin the session earlier such that it can end earlier. It will be no more than one hour and will not go past 5:30. The problems from these sessions will be due on Gradescope at 11:59 pm on Friday, July 7. Late work will not be accepted.

Laboratory Report (Prelab, Postlab & Notebook) – Each experiment will require a preliminary laboratory report (prelab), lab notebook, and postlab write-up. Please see the Report Information handout for information to always include in sections of each lab report.

Prelab Assignments

Prepared students make for a safer and more efficient lab experience. By coming to lab unprepared you are not only putting yourself at risk but also your classmates, TAs, and instructors. Lab preparation includes familiarizing yourself with techniques relevant to the experiment (assigned chapter readings and any handouts), and completing the prelab assignment. Detailed instructions about the prelab assignment are available in the “Lab Report Information” document on LATTE. All prelab assignments will take on the same general format presented in this document, but will be tailored to the specific experiment being conducted as described in the experiment document available for that lab on LATTE.

Completed prelab assignments must be turned in on Gradescope by 12:55 pm on the day you will complete that experiment in lab. The exception to this is the first lab in which you will complete the prelab assignment together in lab and submit your work with your postlab assignment. All other prelabs are due at 12:55 pm on Gradescope on the day of the experiment. Personal laptops and cell phones are not allowed in the organic lab so you must turn in your assignment before entering the lab. The deadline is therefore set to 5 minutes before the start of lab so you will be in lab on time. Late lab reports will earn a point deduction. **You cannot complete the experiment if you do not turn in a complete prelab assignment.** Your TA will confirm that your submission was made on Gradescope and complete in your notebook prior to letting you begin the experiment. If your prelab is not complete you will be asked to leave the lab. You may return if you submit your prelab assignment before 1:30 pm. Your prelab assignment will earn a point deduction for being late. Prelabs are not accepted after 1:30 pm.

Lab Notebooks

You must maintain a proper scientific lab notebook during every experiment. This can be any notebook in which the pages cannot be easily removed (any notebook without perforated pages). You do not need a carbon copy notebook. This notebook should be used only as your lab notebook and not contain work for any other classes. Your TA must review your notebook and sign it at the end of every experiment. You will include pictures of your lab notebook as part of your lab report. Your lab notebook must be legible. If your TA and instructor cannot easily read your notebook you will not earn credit for it.

Lab Performance

Your TA will assess your performance in lab during each session and this will be incorporated into your lab notebook grade for each experiment. If you properly follow all safety regulations, display appropriate lab etiquette, and do your best to work through the experiment efficiently you will receive full credit. Please see the “Lab Performance” document available on LATTE for detailed point deductions for inappropriate behavior.

Attendance at all lab sessions is mandatory. If you miss a lab session due to illness you must contact the course instructor prior to the missed lab session. Missed sessions due to illness will be dealt with on a

case-by-case basis and may require documentation. Due to the pace of the course, make up experiments are not possible during summer school. If you are more than 30 minutes late to the lab session you may not be allowed to complete the experiment and may earn a 0 for all assignments associated with that experiment. Many of the labs require the full lab period so starting more than 30 minutes late will make it impossible to safely complete the lab before the end of the session. If you miss more than one experiment you will need to meet with the course instructor to discuss whether or not it is best for you to stay enrolled in the course.

Post Labs

Post labs will be completed for each experiment and submitted on Gradescope. See the “Lab Report Information” document on LATTE for detailed information. All post labs will follow the same general format (utilizing the template on LATTE) but will be tailored to each experiment according to the experiment document. Post labs must be completed individually even when the lab work is done with a lab partner. See the course schedule for due dates.

Lab Report section	Points
Prelab	25
Lab Notebook & Lab Performance	25
Post Lab Write-up	30
Post-lab questions	20

While it is important that you submit your work on time, I understand that life sometimes throws curveballs, so each student is allowed **one, no-questions-asked, 24-hour** deadline extension during the semester for any one part of a lab report. This cannot be used on a prelab assignment. Please email your TA if you need this extension.

Final Exam

There will be a cumulative final exam covering all material (experiments & spectroscopy) from this course. The exam will be administered during the final exam session on Friday, July 7 at 9 am. The location will be announced closer to the date of the exam. You are expected to understand what was done in each experiment, why it was done, and how it works on both a macroscopic and microscopic level. You will also be expected to solve spectroscopy problems.

Evaluation

Final grades will reflect your weighted average on the course assignments as listed below. Conversions from weighted average to letter grade are also listed below. Percentages will be rounded to the nearest tenth decimal place.

Class Element	Grade Percentage
Lab Reports (Prelab, Notebook & Postlab Write-Up/Questions)	70%
Spectroscopy Questions from Videos & Problem Sessions	10%
Final Exam	20%

Letter Grade	Percentage	Letter Grade	Percentage
A	93.0 – 100.0	C	73.0 – 76.9
A-	90.0 – 92.9	C-	70.0 – 72.9
B+	87.0 – 89.9	D+	67.0 – 69.9
B	83.0 – 86.9	D	63.0 – 66.9
B-	80.0 – 82.9	D-	60.0 – 62.9
C+	77.0 – 79.9	E	0 – 59.9

Regrades

If you suspect there was an error in grading, you may request a regrade of an assessment within *3 days* of the document being returned. Requests made more than 3 days after the document is returned will not be honored. Prior to requesting a regrade, you must first discuss the grading with your TA. Oftentimes this discussion will clear up the confusion. There are a few grading errors that TAs can adjust themselves. If this conversation does not resolve the concern, please submit a formal regrade request on Gradescope. In your request, please summarize the grading concern as well as the discussion you had with your TA. Regrade requests that do not include both of these will not be considered.

Lab Safety

Safety in lab is our number one priority. We will cover necessary safety considerations regularly throughout the semester and safety resources will be available on LATTE. The following list highlights some of the most important safety regulations that will be enforced in lab. Not following these will result in deduction of lab performance credit. For some violations, you must leave the lab and fix the violation before you will be allowed to do the experiment. Continued violation may result in removal from the lab session or the course.

- Lab goggles must be worn properly at all times in the lab (anywhere beyond Prof. Murray's office door). Even if you are not actively working with a chemical one of your classmates may be. If you wear glasses you must wear lab goggles over your glasses. Glasses are not designed to

protect your eyes from splashes and are therefore not appropriate for safety purposes. Contact lenses may be worn but please inform your TA if you wear contacts in lab so they are aware in the event of an emergency.

- Proper lab attire is required. This includes:
 - Long pants, skirts or dresses that reach to the ankle. Capris, $\frac{3}{4}$ pants, short skirts/dresses and shorts are not allowed unless tights or leggings are worn underneath them.
 - Shoes that fully enclose the foot and do not have open backs. Sandals, ballet flats, clogs, and crocs are a few examples of inappropriate shoes.
 - Long hair must be tied back. If your hair is long enough to easily stay confined in a ponytail then it should be tied back.
 - Shirts must, at a minimum, reach the edge of the shoulder. Spaghetti strap or strapless tops are not allowed.
 - Shirts must fully cover your midriff (front and back) while both standing and moving. If you reach your arms above your head and your stomach or back becomes exposed then the shirt is not acceptable for lab.
 - Clothing should not be overly loose or baggy, especially sleeves. Baggy sleeves can easily knock things over on the lab bench.
- Personal laptops and tablets are not allowed in the organic lab and should be kept in your backpack. We will regularly work with solvents that can easily destroy your laptop/tablet in seconds if they are spilled on it. Make sure to submit all your assignments on Gradescope **before** entering the lab.
- Cell phones are not to be used in the organic lab. There are two reasons for this. First, when you are on your cell phone you are not paying attention to your surroundings which is a major safety hazard in the lab. Second, many of the solvents that we work with in lab can easily destroy your phone in seconds if they are spilled on it. If you need to use your cell phone for any reason, step out of the lab area to do so. If your TA or an instructor sees you with your cell phone out during lab, you will be asked to put it away and lose participation credit. If you are found using your cell phone frequently you may be asked to leave the lab and receive a 0 for that lab report. If you have something going on outside of lab that will necessitate having access to your phone during lab, please discuss this with the lab instructor and/or TA prior to the start of the lab session.
- It is advised that you do not wear smart watches while working in the organic chemistry lab. These will not be prohibited but you are assuming the risk of something spilling on it and destroying it if you choose to wear it in lab.
- No food or drink of any kind is allowed in the lab.
- Gloves must be worn at all times when working on your experiment in the lab. Remove gloves before leaving the lab. Do not use gloves on door handles, while handling personal items such as your cell phone, and avoid touching your face with gloves on.
- Smoking and vaping are not allowed in the lab.
- Chewing gum is not allowed in the lab.

Essential Resources

Accommodations

Brandeis seeks to welcome and include all students. If you are a student who needs accommodations as outlined in an accommodations letter, I want to support you. In order to provide test accommodations, I need the letter more than 48 hours in advance. I want to provide your accommodations, but cannot do so retroactively. If you have questions about documenting a disability or requesting accommodations, please contact Student Accessibility Support (SAS) (<https://www.brandeis.edu/accessibility/>) at 781.736.3470 or access@brandeis.edu.

Apps or Tools/Equipment

In order to complete work for this course you must have access to the following:

- The internet.
- A laptop or tablet capable of accessing and completing tasks in LATTE, Echo360, Zoom, G-Suite, and Gradescope.
- A method of uploading images of handwritten work to Gradescope. There are many options for this including a scanner, a digital camera that can connect to your computer/tablet, a scanner app on your phone/tablet, the “Notes” app on an iPhone, etc.
- ChemDraw is required. Please see LATTE for instructions for downloading the program (free to students enrolled in Chem 25/29).

LATTE

LATTE is the Brandeis learning management system: <http://latte.brandeis.edu>. Login using your UNET ID and password.

Library

The Brandeis Library collections and staff offer resources and services to support Brandeis students, faculty and staff. These include workshops, consultations, collaboration, materials and instruction on emerging trends in technologies such as machine learning, emerging trends in research such as data visualization, and emerging trends in scholarship such as open access. Librarians at the Circulation Desk, Research Help Desk, Archives & Special Collections, Sound & Image Media Studios, MakerLab, AutomationLab, and Digital Scholarship Lab are available to help you.

<https://www.brandeis.edu/library/about/index.html>

Privacy

This class requires the use of tools that may disclose your coursework and identity to parties outside the class. To protect your privacy, you may choose to use a pseudonym/alias rather than your name in submitting such work. You must share the pseudonym/ alias with me and any teaching assistants as needed. Alternatively, with prior consultation, you may submit such work directly to me.

Student Support

Brandeis University is committed to supporting all our students so they can thrive. The following resources are available to help with the many academic and non-academic factors that contribute to student success (finances, health, food supply, housing, mental health counseling, academic advising, physical and social activities, etc.). Please explore the many links on this [Support at Brandeis](https://www.brandeis.edu/support/undergraduatestudents/browse.html) page (<https://www.brandeis.edu/support/undergraduatestudents/browse.html>) to find out more about the resources that Brandeis provides to help you and your classmates to achieve success

Teaching Continuity

The goal for this course is to provide clear and consistent expectations to students. Things may change over the course of the semester that may require us to adapt assignments, due dates, expectations, content delivery, policies, and potentially other aspects of this course. My goal is to be as transparent and honest with you as possible throughout the semester when these changes are necessary. That means I might not always have all the answers all the time, plans might need to change multiple times, and there may be times of uncertainty as we await guidance from the university. I promise to communicate openly and honestly with you throughout this semester. In return, I ask for your patience during times of uncertainty and your willingness to adapt with me. If you ever feel confused or overwhelmed by the expectations of this course, please do not hesitate to contact the instructor.

Course Plan

The schedule below is subject to change. Any necessary adjustments will be announced to LATTE and a new version of the schedule will be posted. All due dates and times are in EST.

Date	Course Element
Tuesday, 6/6	Exp 1: Check In & Solubility Prelab for Exp 1 will be completed during lab Prelab, Postlab & Notebook Due Friday 6/9 at 11:59 pm
Thursday, 6/8	Exp 2: Extraction Prelab due 6/8 at 12:55 pm Postlab & Notebook Due Tuesday 6/13 at 11:59 pm
Tuesday, 6/13	Exp 3: TLC Prelab due 6/13 at 12:55 pm Postlab & Notebook Due Friday 6/16 at 11:59 pm
Thursday, 6/15	Exp 4: Column Chromatography Prelab due 6/15 at 12:55 pm Postlab & Notebook Due Tuesday 6/20 at 11:59 pm
Tuesday, 6/20	Exp 5: Distillation & GC Prelab due 6/20 at 12:55 pm Postlab & Notebook due Friday 6/23 at 11:59 pm
Thursday, 6/22	Exp 6: Nucleophilic Substitution Spectroscopy Problem Session 4:30 – 5:30 (or earlier, see syllabus) Prelab due 6/22 at 12:55 pm Postlab & Notebook due Tuesday, 6/27 at 11:59 pm
Tuesday, 6/27	Exp 7: Alkene bromination Prelab due 6/27 at 12:55 pm Postlab & Notebook due Friday, 6/30 at 11:59 pm
Thursday, 6/29	Exp 8: Elimination Spectroscopy Problem Session 4:30 – 5:30 (or earlier, see syllabus) Prelab due 6/29 at 12:55 pm Postlab & Notebook due Wednesday, 7/5 at 11:59 pm
Wednesday, 7/5 BRANDEIS TUESDAY!!!	Exp 9: Iodolactonization Prelab due 7/5 at 12:55 pm Postlab & Notebook due Friday, 7/7 at 11:59 pm – Note: Late work is not accepted for this assignment!!!
Friday, 7/7	Final Exam 9 am No work will be accepted after 11:59 pm on Friday, July 7.

