Chemistry 29a Organic Chemistry Laboratory I
Fall 2019 Syllabus
Brandeis University

Instructor
Prof. Kristen Mascall • Office: SSC 00-08B • Email: kmascall@brandeis.edu • Telephone: 6-2545

Lab Supervisor
Mr. Gary Koltov • Office: SSC 00-18 • Email: gkoltov@brandeis.edu • Telephone: 6-2575

Course description
The CHEM 29a laboratory course affords practical experience in the synthesis, isolation, and analysis of organic compounds. Various techniques are introduced, including extraction, distillation, chromatography, and crystallization. Experimental procedures reported in current literature will be adapted in the lab to prepare molecules of biological significance. Spectroscopic methods are introduced as a means of analyzing compound structures.

Prerequisite: A satisfactory grade (C- or better) in Chem 18b or Chem 19b or the equivalent. Co-requisite: 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.

Learning goals and objectives
- Understand organic chemistry in context of scientific literature
- Connect textbook reactions with practical laboratory techniques
- Read, follow and adapt literature procedures for a reaction goal
- Complete reaction sequence to a target molecule with research applications
- Develop scientific writing skills through lab reports

Class times and attendance
- Lectures: Fri 11:00 am – 12:20 pm in Gerstenzang 123.
- Lab sections: Mon (Sec 1), Tues (Sec 2), Wed (Sec 3), Thurs (Sec 4), Fri (Sec 5), 1:00 – 5:20 pm in Shapiro Science Center 00-08.
- A brief prelab lecture will be given by your TA at the beginning of each lab.
- Attendance at all labs and lectures is mandatory!
- You are expected to arrive on time to each lab section so that the prelab lecture and experiment can begin promptly. If you are more than five minutes late to lab, both your prelab and lab report will be considered late and you will lose 10 points on each.
- A reasonable expectation is that you will expend at least three hours of out-of-class effort for every week of instruction.
Office Hours

- Prof. Mascall’s regular weekly office hours: Mon, Wed, Thurs 12:00 – 2:00 pm in SSC 00-08B, and other times by appointment.
- Prof. Mascall’s office hours during Chem 25a exam weeks: Mon, Tues, Thurs 12:00 – 2:00 pm in SSC 00-08B.
- Your lab TA will hold office hours at a time determined during your first lab session.

Required materials

- Duplicate page spiral bound laboratory notebook.
- Safety goggles – You may use your safety goggles from Chem 18/19, or purchase the required goggles at the Brandeis University bookstore or at www.amazon.com (search for “Uvex S3960C Stealth Safety Goggles”).
- ChemDraw software (see “Online resources” section below) – in order to fulfil the Digital Literacy (dl) requirement, the use of ChemDraw for drawing chemical structures is required for all laboratory reports.

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

Online resources

- LATTE is the online course website at Brandeis. All course handouts 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.
- ChemDraw and Chem3D software: https://kb.brandeis.edu/display/SCI/ChemDraw+Professional (see “Installation of Personal Copies” section). The use of this software for drawing chemical structures will be required for all laboratory reports!

Preparation for lab

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 and any handouts), and completing the prelab. Please note that there is a grade penalty for incomplete prelabs and you will not be allowed to begin the experiment until the prelab is completed.

Laboratory safety

Lab safety requires a rigorously enforced dress code! You will not be allowed to begin a lab without acceptable attire. No skin should be exposed, except for face and hands. Open-toed shoes, shorts, short skirts, sleeveless tops, and midriff-baring or open-back shirts are not proper laboratory attire. Safety goggles are to be worn at all times while in the lab. Eating, drinking, smoking and chewing gum are strictly forbidden in lab. Long hair should be tied back. At Check-In, you will be asked to read and sign a Laboratory Safety handout.
Course Assessment
Grades will be distributed as follows:
- Laboratory reports 60%
- Lab performance 10% (evaluated by your TA)
- Two class exams 30%

Course grades will be determined based on the class average and student distributions around the average.

Laboratory reports
Each experiment will require a preliminary laboratory report (prelab) and a final laboratory report. Please see the Report Information handout for information to always include in sections of each lab report.

Download the appropriate lab report file from the LATTE, and do not modify any formatting. Chemdraw software is required for drawing structures, in order to fulfil the Digital Literacy (dl) requirement (see online resources above). Each section of the prelab/final report is limited to one page. Information presented on the wrong page or exceeding the 1-page section limit will not receive any credit.

Prelabs: See the Report Information handout for prelab requirements. Your TA will check your prelab at the beginning of the lab before you begin the experiment. You will lose 10 points if your prelab is incomplete, and you will not be allowed to begin the experiment until the prelab is completed.

During lab: A duplicate page notebook is required to record your lab procedure, observations, and data. The carbon copy pages must be turned in with the final lab report.

Final laboratory reports: See the Report Information handout for report requirements. Your prelab and carbon copy notebook pages are part of your final report. You may revise prelab information as needed, but only submit one version for grading. Printed data such as GC traces or spectra are always required with the final report. Reports are due by the beginning of the lab period following experiment completion. Late reports lose 10 points per day (24-hr period). Graded reports will be returned by your TA at the lab following the session when the report was due. Lab reports are graded out of 100 points. The point distribution is as follows:

<table>
<thead>
<tr>
<th>Report section</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prelab</td>
<td>25</td>
</tr>
<tr>
<td>Notebook pages: procedure, observations, etc.</td>
<td>25</td>
</tr>
<tr>
<td>Results (including wt, yield, mp, etc.), discussion, conclusions</td>
<td>30</td>
</tr>
<tr>
<td>Questions</td>
<td>20</td>
</tr>
</tbody>
</table>

Regrades
If you suspect errors in grading, first discuss it with your TA, then with the instructor as needed. Please note that your TA cannot adjust grades once the graded document has been returned. Any regrades must be submitted to Dr. Mascall with a note explaining the nature of the grading dispute no later than one week after the document is returned. The entire document will be regraded.
Makeup lab policies

- If you attend a make-up lab, your report is due according to the schedule in the syllabus.
- No more than two makeup labs will be permitted during the semester for any reason.
- Medically excused absences and absence due to emergency communicated prior to the absence will be granted a make-up lab. A note from a doctor/medical office may be requested.
- Makeup labs are granted for academic, athletic, and religious conflicts. Your absence should be communicated at least two weeks in advance.
- Makeup labs are not guaranteed for absence due to recreational travel, family events, etc.
- Requests for a makeup lab for reasons other than outlined above will be dealt with on a case-by-case basis.
- In order to request a makeup lab, please email Prof. Mascall explaining the reason for the request, and indicate the day(s) of the week you are available to make up the missed lab.

Use of electronics

The use of electronic devices (cellular phones, laptops, tablets, etc.) is strictly prohibited in labs and exams. The use of tablets is permitted during lectures for note-taking. If you require special accommodations for electronic use, please see me.

Academic Accommodations

Brandeis seeks to welcome and include all students. If you are a student who needs accommodations as outlined in an accommodations letter, please talk with me and present your letter of accommodation as soon as you can. I will work with you to determine the best way to support you. In order to provide test accommodations, I need the letter more than 48 hours in advance for planning and scheduling purposes. I am committed to providing your accommodations, but cannot do so retroactively. If you have questions about documenting a disability or requesting accommodations, please contact Student Accessibility Support (SAS) at 781.736.3470 or access@brandeis.edu.

Academic Integrity

You are expected to be familiar with, and to follow, the University’s policies on academic integrity. Please consult the Brandeis University Handbook on Rights and Responsibilities for all policies and procedures (pay particular attention to section 4). Any work submitted by a student for academic credit will be the student’s own work. Allegations of alleged academic dishonesty will be reported to the Brandeis Student Rights and Community Standards Office. A first offense may result in zero assignment credit for all involved, and a repeat offense may result in suspension or dismissal from the University.
## Course Schedule

<table>
<thead>
<tr>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
<th>Experiment Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>First Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td>Lecture</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sept</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>Lab 1 Check in</td>
</tr>
<tr>
<td>Labor Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Lab 1 Check in</td>
<td>Lab 1 Check in</td>
<td>Lecture Lab 1 Check in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Lab 2</td>
<td>Lab 2</td>
<td>Lab 2</td>
<td>Lab 1 Exp. 1 – Thin-Layer chromatography</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Lab 3</td>
<td>Lab 3</td>
<td>Lab 3</td>
<td>Lab 2 Exp. 2 – Distillation and chromatography</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Lab 4</td>
<td>Lab 4</td>
<td>Lab 4</td>
<td>Lab 3 Exp. 3 – Who else has my compound?</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Lab 5</td>
<td>Lab 5</td>
<td>Lab 5</td>
<td>Lab 4 Exp. 4 – Extraction</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Lab 6</td>
<td>Lab 6</td>
<td>Lab 6</td>
<td>Lab 5 Exp. 5 – Fischer esterification</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Lab 7</td>
<td>Lab 7</td>
<td>Lab 7</td>
<td>Lab 5 (continued) No lab</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Lab 8</td>
<td>Lab 8</td>
<td>Lab 8</td>
<td>Lab 6 Reaction 1 – Alkene hydration</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Lab 9</td>
<td>Lab 9</td>
<td>Lab 9</td>
<td>Lab 7 Reaction 2 setup – Anomeric substitution</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Lab 10</td>
<td>Lab 10</td>
<td>Lab 10</td>
<td>Lab 8 Reaction 2 purification – Anomeric substitution</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Lab 11</td>
<td>Lab 11</td>
<td>Lab 11</td>
<td>Lab 9 Reaction 3 setup – Alkene metathesis</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Lab 12</td>
<td>Lab 12</td>
<td>Lab 12</td>
<td>Lab 10 Reaction 4 – Nucleophilic substitution</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Lab 13</td>
<td>Lab 13</td>
<td>Lab 13</td>
<td>Lab 8 Literature and Spectroscopy Report due at Exam 2</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>Lab 14</td>
<td>Lab 14</td>
<td>Lab 14</td>
<td>Lab 9 Literature and Spectroscopy Report due on Nov 26 by 12:00 noon</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Lab 15</td>
<td>Lab 15</td>
<td>Lab 15</td>
<td>Lab 10 (Reaction 4) Report due on Nov 26 by 12:00 noon</td>
</tr>
</tbody>
</table>

*Experiment schedule subject to change. Any changes will be announced in class and via LATTE.*