CHEMISTRY 209, Introduction to Organic Chemistry Laboratory

American University of Beirut
Faculty of Arts and Sciences
Department of Chemistry

Course Goal:

The overall objective is to introduce students to the synthetic and purification techniques in organic chemistry. The secondary objective of this course is to increase the students’ knowledge of the involvement of organic chemistry in everyday life.

Introductory Organic Laboratory, Learning Outcomes:
The student should be able to:

i. Record experimental results in a laboratory notebook according to standard scientific guidelines.
ii. Perform laboratory techniques using proper safety procedures.
iii. Apply basic organic laboratory techniques (recrystallization, distillation, extraction, chromatography).
iv. Interpret experimental results.
v. Carry out synthesis of organic compounds following a published protocol.
vi. Identify unknown organic compounds using basic organic chemistry laboratory procedures.
vii. Demonstrate basic chemical synthesis abilities.

REQUIRED COURSE MATERIALS:

1. Text: Chemistry 209 manual (purchased from the chemistry office) and handouts distributed in class.

2. Laboratory Notebook: A hard-cover or soft cover notebook with numbered gridded pages and tear-out carbon-copy duplicate pages would be a good choice in order to record your laboratory work.

3. Safety Goggles: Supplied by the Chemistry Department.

4. Rubber Gloves: To protect your hands while handling chemicals.

5. Lab Coat: Available at bookstore.

6. Cleaning Liquid (detergent): For cleaning glassware.

7. A Non-graphing Simple Calculator: For use on quizzes and report writing.
COURSE POLICIES:

1. **Promptness:** Laboratory session will begin and end promptly as scheduled; students will not be allowed to work overtime or during off-hours. If a student arrives late to the lab, he or she cannot stay longer than the latest student who came on time.

2. **Make-up:** A missed lab period may be made up only for a valid medical reason and with a note from the **AUB INFIRMARY.** The Valid documentation MUST be provided within a week of the absence to your lab instructor; otherwise, the absence will not be excused. **NOTE:** A student with 3 or more absences (valid or otherwise) will be dropped from the course.

3. **Quizzes:** A short quiz (10 min) will be given in the lab at the beginning of the lab period (random timing) including Check-Out week. The material for the quizzes will be the lab you are about to do that particular week. **A safety quiz will be given during the first week.**

4. **Preparation:** Adequate preparation before the lab will reduce frustration and prevent accidents. Attempting to perform the experiment while reading the procedure for the first time is a little more than a waste of time and can lead to hazardous mistakes. Part of the evaluation points assigned by your lab instructor will be determined on the basis of your preparation.

5. **Laboratory Safety:** All students in the lab must adhere to the safety rules. Noncompliance with safety rules will result in expulsion from the lab and no make-up will be allowed.

6. **Exams that Conflict With Lab:** Your laboratory period is a scheduled class. If you have a group exam that conflicts with your lab, your lab takes priority. You will have to make arrangements with the professor of the class with the group exam to take a make-up exam.

7. **Academic Honesty:** You are being graded on the work you perform. Use of lab reports from other students (past or present) is expressly forbidden. Both the lender and the borrower are subject to severe penalties. Some discussion about the labs is acceptable at the discretion of the lab instructor, but you must perform all the work (including the data analysis and answering of questions) yourself. The lab instructor is free to ask you at any point to explain what you are doing. This is to help the lab instructor instruct the confused and prevent copying of answers. If you are confused, ask for help. Don’t just copy an answer. **Academic honesty also applies to all quizzes and exams in this course.**

8. **Before Your Departure from the Lab.:**
   (a) Show your results to your instructor to get his/her approval and submit your report.
   (b) Clean any used equipment thoroughly.
   (c) Return to the storeroom all items borrowed on that day.
   (d) Clean your desk with a sponge.
   (e) Make sure that the steam, water and gas taps are turned off.
   (f) Do not forget to lock your locker. The cost of every lost or missing item and of borrowed equipment that is not returned to the storeroom will be charged against your account.
9. Grading:

**Tentative Grading Schedule:**
Notebook 20%
Unknowns and Yields 10%
Drop Quizzes 20%
Final Examination 40%
Evaluation 10%

The mid-semester and final exams will be designed to test your understanding of experimental and theoretical aspects of the experiments completed. The personal evaluation will be based on attitude, conscientious attention to the experiments, improvement in technique with experience and attention to laboratory directions and safety.

10. **Schedule of Experiments:**

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<thead>
<tr>
<th>Week</th>
<th>Experiment</th>
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<tbody>
<tr>
<td>June 25</td>
<td>Safety, check-in and melting points (exp. # 1)</td>
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<tr>
<td>June 27</td>
<td>Recrystallization (expt. # 2)</td>
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<tr>
<td>July 2</td>
<td>Distillation (expt. # 3)</td>
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<td>July 4</td>
<td>Chromatography (expt. # 4)</td>
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<td>July 9</td>
<td>Extraction (expt. # 5)</td>
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<td>July 11</td>
<td>Acid base extraction (expt. # 6)</td>
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<td>July 16</td>
<td>Synthesis of n-butyl bromide (expt. # 7)</td>
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<td>July 18</td>
<td>Amylenes (expt. # 8)</td>
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<tr>
<td>July 23</td>
<td>Synthesis of isoamyl acetate (expt. # 9)</td>
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<tr>
<td>July 25</td>
<td>Cholesterol benzoate (expt. # 10) and acetanilide (expt. # 11)</td>
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<tr>
<td>July 30</td>
<td>Preparation of aspirin (expt. # 12) &amp; make-up for missed lab/check out</td>
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