Syllabus Organic Chemistry Laboratory I
CHEM 222, fall 2014

Location Room 166 SCL (Sterling Chemistry Lab)

Time 1:00 to 4:30pm, M, T, W, Th or F. Students attend one lab session per week, on their assigned lab day. **See the power point presentation at classesv2/ Announcements for how to use PS to register for lab.**

Instructor: Dr. Christine DiMeglio, 109A SCL, 203-432-5914, christine.dimeglio@yale.edu;
Office hours: M-F, during or after lab, or email for a morning appointment

Lab staff: Anna Yu (anna.q.yu@yale.edu), 151 SCL, 432-4758 and Lisa Vitale (elisa.vitale@yale.edu), 142A SCL, 432-3964.

Teaching assistants: TBA

Required materials:

Lab textbook: **Techniques in Organic Chemistry**, Jerry Mohrig, *et al*., W.H. Freeman and Company, 3rd edition **(**ISBN-13: 978-1429219563**).** Buy online or at the **Yale Bookstore.**

Course packet: Online at classesv2/resources. A hardcopy can be purchased from TYCO beginning 09/03

Lab Notebook: ISBN-13: 978-0716739005 (you may reuse a notebook if it is capable of making copies for your TA and if there are plenty of pages remaining!)

Long Lab Coat-to the knee! Buy it at the Yale Bookstore or from an online vendor. Do not buy short lab coats!

Unisex size chart: http://www.allseasonsuniforms.com/fssize.htm
Unisex, 40 inch, knee length, long sleeve, 65% poly/35% cotton, lab coat – suggested brands are White Swan and Dickies.

Proper Clothing: pants that cover legs and ankles (no shorts, skirts or Capri), shoes that cover the ENTIRE foot (no sandals, flip flops or ballet type), no earbuds or head phones. If you are in lab with improper clothing you will need to leave, change and walk back up the hill.

Thick Sharpie Markers® for writing on glassware **and a LOCK for the backpack/coat lockers!**

We Provide: Lab safety glasses/goggles and nitrile gloves

Objectives for CHEM 222:
To train students in basic skills so they may 1) operate safely in lab, 2) manage chemical waste, 3) access chemical information through online data bases, 4) synthesize, purify and characterize organic compounds and 5) practice responsible record keeping and report writing.

Overview of a Typical Lab Day

- Arrive on time and immediately set up work station: get gloves, lab coat and glasses; get pipettes, required glassware, ring stands, clamps and other support materials; organize notebook, etc.
- Once instructor and/or TA are/is available, begin acquiring necessary chemicals.
- Before beginning experiment, listen to pre-lab lecture by TA.
- Use Experimental Plan to perform the experiment while recording actions/observations in lab notebook.
- Ask questions as necessary.

- Clean up thoroughly, following waste disposal protocols.
- Have TA sign notebook before leaving lab.

Overview of Important Lab Policies:

- Students with improper clothing will need to leave the lab immediately and return home to change.
- Attendance at scheduled lab sessions is expected. In case of illness, injury, personal or family emergency a student should notify the course instructor in advance of the absence. (Unexcused absence = 20 point penalty)
- Students must submit an experimental plan prior to beginning an experiment. Unprepared students will not be permitted to perform the experiment and will need to reschedule. Student who have an unexcused absence will be penalized 20 points.
- Due dates apply even when a student is absent. Absent students submit work electronically using the classesv2 drop-box.
- Late work is penalized at 5% per day. Submit late work electronically using the classesv2 drop-box.
- While inside the lab, students will wear a lab coat and eye protection and the will not use ear buds, head phones or cell phones for chatting. Students may use cell phones in an emergency.
- Personal or professional Issues that impact one's ability to meet course responsibilities should be brought to Dr. DiMeglio's attention.
- Students need to notify the course instructor (Christine.dimeglio@yale.edu) and their lab TA by email **in advance of an absence** and will need to provide a Dean's Excuse to qualify for a make-up session. A make-up lab will be scheduled within 1 week of the missed experiment. In case of travel or appointments, students are encouraged to make advanced make-up arrangements with the course instructor.

Lab penalties (point deductions)

- Late work: 5% per day, beginning the day it is due.
- Experimental Plan: if a student is not prepared for lab the penalty is 10 points, even if the student makes up the lab on another day.
- Leaving your work station a mess – 5 points each time
- Unexcused absence-20 points

Academic Integrity

We hope that you experience professional growth in this course, and the following guidelines are designed toward that goal. Work independently in the lab and on all lab assignments unless specifically instructed to work with others. Independently compose all assignments, including pre-lab plans, experimental notes, product data and spectra, reports and any other graded assignment. Refrain from photocopying or electronically copying material from course packets, text books, internet websites, and subsequently pasting such material into an assignment as if it were your own work. Refrain from copying, photocopying or electronically copying any information from another student's work (past or present!) and subsequently pasting that work into an assignment that will be graded. Refrain from allowing another student to copy any of your work that will be or has already been submitted for grading. When you are finished with this course DO NOT make your graded material available to another student. Refrain from providing or asking for information about the content of lab exams. Use properly referenced quotes and paraphrases that support your arguments and ideas. Provide proper references for any material that is not your own work, including personal communications. The course packet gives complete information on proper referencing.

Grades

Numerical grades are calculated as (total points earned -penalties)/(total points available) x100. Letter grades are assigned at the end of the session by the instructor and each TA section is scaled as necessary. Students earn points based on preparation (20% of grade), participation and post-lab assignments (50% of grade) and check out lab exam (30% of grade).

Late Assignments are welcomed but will be penalized at 5% per day. Late EPs are not welcome and it is an automatic 10 point penalty.

Graded Assignments will be returned in the same time frame given for their preparation. If you are not getting graded feedback you should bring tis to the attention of the course instructor.

Grading Questions/Concerns should be taken to the TA or the instructor within 1 week. Any issue not easily resolved with a TA should always be directed to the instructor.

For More Course Information g*o to classesv2 for CHEM 222.*

Announcements

- Lab Registration and Lab Section Assignments
- Changing to another lab section
- Lab Assignment 1

Resources

- Course Packet

Experiment Schedule

The full experimentation schedule with due dates is in the Course Packet at classesv2

Opening Days

August 25:	Placement Exams for freshmen
August 26-31:	Preference selection for all organic chemistry lab sections
September 1	Labor Day: no classes; preference selection continues
September 2:	Preference selection ends and lab assignments made
September 3:	DS opens and students may self-shuffle to open seats
September 3-5:	Students acquire lab materials and complete Lab Assignment 1

Week Starting, Monday

September 8:

Check –in, Orientation, Gathering Supplies, Safety

September 15:

Project 1: Separation, Purification and Analysis of Salicylic Acid and Camphor

Step 1: Preparation for Experimentation

- Safety: Compose chemical table, research starting materials
- Reagents: mass reagents, prepare solutions, explore solubility of salicylic acid and camphor.
- Equipment: learn how to use separatory funnel, vacuum filtration, vacuum evaporation of solvent, analytical balances, melt point instruments

September 22:

Project 1: *continues*

Step 2: Separation by extraction: acid-base extraction, precipitation and vacuum filtration of product, chemically drying an organic solvent, isolation of a product by evaporation of a solvent

September 29:

Project 1: *concludes*

Step 3: Purification and analysis: purification of salicylic acid by recrystallization; purification of camphor by sublimation; MP analysis of salicylic acid and % recovery of camphor and salicylic acid.

October 6:

Project 2: Synthesis and Characterization of Salicylic Acid from Methyl Salicylate

Step 1: Synthesis of salicylic acid from methyl salicylate

October 13:

Project 2: *concludes*

Step 2: Analysis of product by MP and TLC and % yield. Compare to salicylic acid of Project 1.

October 20:

Lab classes do not meet during fall break.

Students are assigned to read the Chapter on IR Spectroscopy and to submit an assignment prior to their next lab class.

October 27:

Project 3: Synthesis of Camphor from Borneol by Sodium Hypochlorite Oxidation

. **Step 1:** Synthesis of camphor and monitoring by TLC.

November 3:

Project 3: *concludes*

Step 2: Analysis of Camphor by IR Spectroscopy

Lecture on IR spectroscopy, followed by worksheet, followed by analysis of standard camphor (Project 1) and experimental camphor (Project 3).

November 10:

Project 4: Synthesis of Benzhydryl -1-Propyl Ether by an SN1 Reaction Mechanism

Step 1: Synthesis of benzhydryl-1-propyl ether

November 17:

Project 4: *concludes*

Step 2: Analysis of product by TLC and IR and tying up loose ends of synthesis, as necessary

November 24:

Lab classes do not meet during Thanksgiving recess

December 1:

Lab Check Out and Lab Exam