

## **CHEMISTRY 2125 (Organic Chemistry Lab II), Spring 2024 – Dates Adjusted for the January 16 Freeze**

**\*\*Disclaimer:** The Instructor of Record has the authority to alter this syllabus in the case of weather events, university power outages, pandemics, or any other event that requires the university to close. **\*\***

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### **I. Lab Coordinator- Office and Email:**

Dr. Mary Bean, 318 STL, [mbean3@uh.edu](mailto:mbean3@uh.edu) (Use this address, not Canvas or Teams.)

There are 32-36 sections of organic lab every semester. Always include the course number (2125), the 5-digit class number, and your TA's name in any email to the lab coordinator.

Your TA is the first point of contact for your questions pertaining to lab except for make-up lab requests (see Make-Up Policy).

**Your TA's name:** \_\_\_\_\_ **Office:** \_\_\_\_\_ **Office hours:** \_\_\_\_\_

If your TA cannot satisfactorily resolve an issue, contact the Lab Coordinator as soon as possible. The end of the semester, especially after grades are submitted, is not the best time to report problems. (Example: If the TA is not returning the graded lab reports in a timely manner, let the Lab Coordinator know asap.)

## II. Lab Students Requiring Assistance under the Americans with Disabilities Act:

Please make an appointment with me within the first two weeks of class to discuss your accommodations.

## III. Supplies for Lab:

**For the laboratory you will need the following items:**

1. **The textbook:** "Organic Lab Manual, Custom 2<sup>nd</sup> Edition – University of Houston" ISBN-13: 9781337453042, This is a custom manual published by Cengage Learning. It is available only at the UH Bookstore.
2. **A laboratory notebook** that is permanently bound, has serially pre-numbered pages, and allows you to make a removable carbon copy which can be turned in for grading.
3. **A laboratory coat** that is long-sleeved and knee length. The coat must be completely buttoned during lab.
4. **Sturdy, closed-toed shoes that cover the entire foot.** Sandals or shoes that leave a large area of the foot exposed are NOT allowed.
5. **Safety goggles (NOT SAFETY GLASSES).** The laboratory coat and goggles must be worn in the laboratory at all times anyone in the laboratory is doing experimental work.
6. Long pants or other garment that **completely** covers the legs. Shorts, short skirts, and short dresses are NOT allowed in the lab. Suggestion: Keep a pair of loose scrub pants that may be worn over shorts or under skirts in your backpack.
7. **A STRONG, RELIABLE lock** for your laboratory drawer. This lock must be placed on your drawer at the end of check-in on the first day of lab. You are responsible for any broken, missing, or stolen glassware and equipment at the end of check-in. Lock your drawer whenever you leave your bench, even if only walking across the room. Lock your drawer at the end of every lab period. **Never** leave the combination on the back of a combination lock.

### **A special note about locks:**

If you did not bring your own lock on lab check-in day, remember to bring it to the next lab. The TA will unlock the department lock on the second lab day, **but only if you have your own lock.** Without your own lock, you will not be able to participate in lab.

Forgetting your lock's combination or key is not an excuse for a make-up lab. The TA can cut off your lock, so that you can participate in lab.

## IV. Lab Safety:

The Department of Chemistry takes safety seriously. All safety rules described on page 1 of the lab manual and in the safety video are important for your SAFETY. Two rules are given extra attention below.

### **Goggles:**

Keeping your goggles over your eyes (not on your forehead, on top of your head, or around your neck) at all times **anyone** in the laboratory is doing experimental work is required. These times include while you are writing in your lab notebook, using the melting point apparatus or balance, cleaning up at the end of lab, taking an IR spectrum, and talking to your TA at the TA bench. This precaution may save your eyesight.

If you receive excessive goggle warnings, the TA or the lab coordinator will ask you to leave the lab, and you will receive a zero for the lab report for that period.

### **Cell Phone, Laptop, or Tablet Use:**

Being distracted while performing laboratory work can be dangerous. Use of these electronic devices is a distraction and is prohibited in lab. Common solvents used in the lab, such as acetone, can corrode the components of these devices. The chemistry department is not responsible for any damage caused to these devices if they are used in the lab.

## **V. Grading Policies:**

### **A. Lab Reports:** 60% of the grade

A copy of the Lab Report Format with details is given later in the syllabus. There are eleven lab reports for the semester. The Pre-lab (sections I-V) is due and must be given to your TA at the beginning of each lab period. The Experimental Procedure/Observations/Data section (Section VI) is due at the end of the lab period and must be given to the TA before you leave the lab. The Post-lab (written after lab, sections VII-X) is due at 11:59 PM TWO DAYS after the lab is **completed**. (Example: Monday labs are due on Wednesday.) Completion of a lab means that all data has been collected. Data includes melting points, masses, and TLC.

One lab report grade is automatically dropped for each student.

### **Each lab report will be graded on the following basis:**

Laboratory report write-up: ~ 50% (This is the “effort” portion of the grade.)

Yield, purity, identification of unknowns, etc.: ~ 50% (This is the “results” portion of the grade.)

**Note:** All products generated must be turned in to the TA to receive credit for the lab.

**Late Lab Reports:** The penalty for a late lab report is 10 points per day. Under extreme, verifiable circumstances, the lab coordinator, not the TA, may adjust this penalty. Contact the lab coordinator.

**B. Quizzes:** 15% of grade. There are four quizzes. None are dropped. The quizzes may be pop quizzes. The quizzes may cover the experiment of the day or the experiment of the previous week.

**C. Final Exam:** 25% of grade (Covers everything.)

### **D. Letter grade definitions:**

- A = superior performance
- B = very good performance
- C = average performance
- D = poor performance
- F = failing

Please notice that the grade definitions are couched in terms of performance achieved not effort expended. The letter grades are determined by the lab coordinator and are determined by comparing the average in a given section to the overall average of all of the sections. If a TA's stricter than average grading results in a lower class average, that section will receive a curve to compensate for the difference. If a TA's lenient grading results in a much higher class average, that section will receive a curve to compensate for the difference. The latter case occurs infrequently and is used in extreme cases. (For example, a grade distribution in which 80% of students receive A/A- and 20% of students receive B+/B/B- is not possible, reasonable, or fair to students in other sections.)

The starting point for any curve is the standard grade scale given below:

A=93-100, A- =90-92, B+ =87-89, B=83-86, B- =80-82, C+=77-79, C=73-76, C- =70-72, D+=67-69, D=63-66, D- =60-62, F=59 and below

## VI. Academic Honesty Policy:

The organic chemistry laboratory is a class just like any other class. As a result, you are expected to do your own work. **There are no lab partners in the organic chemistry laboratory, and all work is to be done individually.** This includes, but is not limited to, the writing up of your lab reports. You are not allowed to work with others on your lab reports.

Additionally, the melting points and yields of your products may be checked by your lab instructor. The penalty for falsifying laboratory results or engaging in any kind of academic dishonesty may be the award of a grade of "F" for the laboratory course. Any questions or comments regarding this matter should be directed to Dr. Bean.

**Reminder:** Plagiarism is **CHEATING**. Copying directly from any source (the lab manual, a website, another student, an old lab report, chatGPT, or any AI system) is not allowed.

### Academic Honesty WARNING: Melting Range Procedure

The following is the **correct procedure** for obtaining the melting range of a sample when the melting point is known:

The sample is quickly heated to within 10-15°C of its melting point. The heating rate is then slowed to increase 1-2°C per minute until the sample melts.

Setting the digimelt apparatus to rapidly rise through the melting range is NOT the correct procedure and may result in a loss of points or a charge of academic dishonesty.

Example:

If a student allows the temperature to rapidly rise and then puts an impure sample into the digimelt apparatus when the temperature is slightly below the literature value, the sample will instantly melt. (This is NOT correct procedure.) When the TA checks the melting point of the student's sample, and it melts far below the temperature reported by the student, the student will be charged with engaging in academic dishonesty, not with making a mistake in melting point procedure.

## VII. Make-Up Policy:

**A. Missed Lab:** A make-up lab is not guaranteed and is possible only if space allows and the excuse is for a reasonable, **nonacademic** issue. Make-up labs must be done in the week the lab is missed. Make-up labs are arranged by email with the lab coordinator (Dr. Bean), not with the

TA. In the email request, include the course number (2123), the 5-digit class number, and your TA's name. Copy the email to your TA.

If a make-up lab is not possible, and the absence is due to a reason listed in the official UH Excused Absence Policy, it will be excused. The missed lab report grade will be replaced with the average of your lab reports. To receive an excused absence, the absence and excuse must be immediately reported by email to the lab coordinator (Dr. Bean) and **documentation must be provided**. Please copy the TA. In the email request, include the course number (2123 or 2125), the 5-digit class number, and your TA's name.

**B. Missed Quiz:** One make-up quiz will be given at the end of the semester. The make-up quiz will replace any quiz missed with a reasonable excuse. **It cannot be used to replace a lower quiz grade.**

### VIII. UH CAPS Statement:

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS ([www.uh.edu/caps](http://www.uh.edu/caps)) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the "Let's Talk" program, a drop-in consultation service at convenient locations and hours around campus. [http://www.uh.edu/caps/outreach/lets\\_talk.html](http://www.uh.edu/caps/outreach/lets_talk.html)

### IX. Broken or Missing Equipment Policy:

At lab check-in, you will be instructed to verify whether any of the equipment in your assigned drawer is broken or missing. It is important that you carefully check the contents of your drawer and report any discrepancies to your TA. After the initial check-in, if you break or lose equipment from your drawer during the semester, you must purchase replacements at the University Research Stores in the basement of the Fleming Building, Room 70. **Because of the importance of quality control, you may not purchase glassware or equipment from any other source such as amazon.com. You will be charged the full stockroom price if you substitute another brand.**

**IMPORTANT NOTE: The Research Stores only accepts credit (Discover, Mastercard, Visa, and Amex) and debit cards. It does NOT accept cash or Cougar cash.** If you break equipment or something turns up missing during your lab session, you must have a credit or debit card available to purchase a replacement. Equipment cannot be borrowed from Research Stores or your TA. If you cannot finish your lab because you cannot or will not purchase replacement equipment, you must ask your Lab Coordinator (Dr. Bean) for permission to come to a different lab to finish your experiment. An alternate lab may not be available, and it is completely at the Lab Coordinator's discretion whether you will be allowed to make up the lab under this circumstance. Bottom line: Avoid problems by making sure that you have a credit or debit card with you when you come to lab.

At your last scheduled lab session of the semester, you will have the opportunity to check the contents of your drawer and purchase replacement items at the Research Stores as needed. If you do not complete your checkout for any reason (e.g., you drop the class, you do not show up for checkout, etc.) or you cannot or refuse to purchase replacements for broken or missing equipment, you will be charged the cost for replacements plus an additional \$10 service charge on your University fee bill.

***You are solely responsible for the equipment in your drawer. Use the equipment properly and keep track of the equipment when your drawer is unlocked to avoid having to replace costly equipment and possibly incur unnecessary fees. Lock your drawer whenever you step away from it even if only for a moment and especially at the end of the lab period.***

## **X. Care of Equipment, the Lab Space, and Reagents:**

### **A. The fancy equipment:**

Much of the equipment used in scientific laboratories is surprisingly expensive. Over the last four years more than two hundred thousand dollars has been invested in upgrading the equipment and laboratory facilities in the organic laboratories alone. It is obvious that the equipment recently added must be maintained in good condition for many years, since it cannot be replaced very often. If it is to have a satisfactory lifetime, you must cooperate by using it correctly.

Most importantly, the balances must not be abused by having chemicals spilled on them. To avoid doing so, place on the balance pan only a container which is clean and dry on the outside, and **NEVER ADD CHEMICALS TO THE CONTAINER WHILE IT IS ON THE BALANCE PAN**. First remove the container to the desktop nearby, add the chemicals, then return the container to the balance for reweighing.

### **B. Liquid Reagents:**

Place no liquid wastes in the sinks except those approved for disposal down the drain. All others must be placed in the properly labeled waste bottles provided for them.

### **C. Solid Reagents:**

Place no solid wastes of any kind in the sinks or drain troughs. Boiling chips are particularly hard on drains. Keep them out of the sinks.

### **D. Any Reagent:**

Reagent bottles must be capped at all times they are not actually being used. **You** must replace the cap on each bottle as soon as you have finished using it. Never uncap more than one bottle at a time. **Never** transfer solid material from the bottle to the inverted bottle cap. Use a weighing boat for that purpose. **Never** leave unlabeled materials in weighing boats, etc., on the benchtop.

**Never return unused reagent to the original container, i.e., don't contaminate the source.**

If proper techniques are used, there is little occasion for chemicals to be spilled on the benchtops near the balances or on the hood surfaces. Any chemicals spilled should be cleaned off immediately by the person spilling them using a method appropriate to the substance spilled. Ask the TA for help.

## **XI. The Laboratory Notebook (What to do with it and how to make corrections):**

Section VI of the Laboratory Report Format (found below) is to be recorded in the laboratory notebook. The lab notebook is intended to be the record of what you do and observe in the laboratory. Although it should be written as legibly as possible, accuracy and completeness are its major goals, rather than neatness. All experimental procedures and observations should be made directly in the laboratory notebook **with ink**. It should be carried to the balance, and the weight measured recorded there. It should accompany you to the melting point apparatus, and so forth.

**SCRAPS OF PAPER WITH EXPERIMENTAL OBSERVATIONS JOTTED ON THEM ARE SUBJECT TO CONFISCATION.**

Some experiments may extend over two lab periods, so you are expected to secure your instructor's initials in your notebook at the beginning of each laboratory period, and at the end as well, so that it is obvious what you wrote during each period.

Corrections of in the notebook must be made in such a way that the original data or observation remains legible. Simply draw one line through the item to be deleted and write in the corrected entry. Never erase, white out, or otherwise attempt to alter the original or the carbon copy. **Whenever corrections are made to data, you must obtain your TA's initials or signature beside the correction.**

The carbon copy is removed from the notebook and turned in to the TA at the end of the lab period. The original remains in the notebook. When writing, be sure to press hard enough that the carbon copy is legible. **If a page in the notebook is skipped within a report, draw an "X" across the page and hand it in with the report. The pages turned in must be sequential.**

All other sections of the lab report may be composed and typed outside of the lab. (See Laboratory Report Format below).

## **XII. The Laboratory Report Format (How to write the lab report):**

Be sure to include your name, **your TA's name** and the 5-digit class # at the top of each page of the report. Always use language appropriate for a scientific paper. For example, statements in the Conclusions section such as "This lab was easy and really fun" or "This lab was really hard and took too much time" are not suitable or relevant. The format for the report is below.

### **I. Title and Date**

This section simply gives the title of the experiment and the date it was (will be) performed.

### **II. Answers to the Pre-Laboratory Exercises**

This section includes the answers to the assigned pre-laboratory questions.

### **III. Purpose**

This section includes a brief explanation of why you are doing the experiment or what you hope to learn.

### **IV. Reactions**

If the lab involves carrying out a chemical reaction, you must write the chemical equation by drawing the structures of the reactants and products. Screen shots of the reaction in the lab manual or from any other source may not be used. Omit this section, if no reactions are involved.

### **V. Table of Physical Constants**

This section is a **table** that lists all of the chemicals that will be used in the experiment, including any products formed, as well as physical data for each compound: molecular weight (g/mol), melting point (°C), boiling point (°C), density (g/ml), and **hazards**. This information can be obtained at various websites such as [www.sigmaaldrich.com](http://www.sigmaaldrich.com), [www.fishersci.com](http://www.fishersci.com), or [www.alfa.com](http://www.alfa.com). Click on the MSDS for each compound to find the physical data.

### **VI. Experimental Procedure/Observations/Data** (Must be written directly into the lab notebook **during** the lab period.)

- This section includes a detailed description of what you did while in the laboratory. Refer to the figure in the Lab Manual for any apparatus used. A sketch of the apparatus is not necessary.
- Use past tense when recording procedure. Example: 10g of X were added to the solution. Use passive voice. Example: The solution was stirred for 1 hour. Not: I stirred the solution for 1 hour.

- Be particular about reporting the actual amounts of materials used (not the amount given in the lab manual) and any modifications to the original procedure. Avoid simply copying the original procedure.
- Include any important observations made during each step such as color changes, precipitation, dissolving of solids, gas evolution, etc. At the end of this section, record any data collected such as melting ranges, weights, etc.

**This section is to be written in the lab in your lab notebook. You should record each step as you perform it or shortly after you perform it. Do not wait until the end of the lab period to recall each step. Data and observations are to be recorded directly into the lab notebook at the time the data is collected or the observations are made.**

**Note:** TLC plates must be sketched to scale in the notebook and then turned in at the end of lab to the TA. GC chromatograms and IR and NMR spectra are considered data. **These must be turned in with the report.**

#### **VII. Calculations**

This section includes calculations such as  $R_f$  values, theoretical yields, percent yields and percent recoveries. Any time a reaction is carried out, it will be necessary to calculate a theoretical and percent yield. If no calculations are needed for the experiment, this section is omitted.

#### **VIII. Results and Discussion**

This section includes the results of the experiment as well as the interpretation of any observations made during the experiment. This is where the yield and melting point or boiling point should be discussed. Additionally, include whether the results of the experiment were as expected. If they were different from the expected results, give a reasonable explanation as to why.

#### **IX. Conclusion**

This section includes an overall evaluation of the results. It should include statements indicating what was learned in the experiment. Additionally, include any modifications to procedure that might improve the outcome of the experiment.

#### **X. Answers to Post-Laboratory Questions**

This section includes the answers to the assigned post-laboratory questions.

### **XIII. When the Sections of the Lab Report Are Due:**

**Sections I-V** will be referred to as the Pre-Lab and must be completed **before** coming to lab. These sections may be typed and printed. These sections must be turned in **at the beginning** of each lab or no credit will be received.

**Section VI** is to be written **in the lab** as you are performing the experiment or reaction. It is not a procedure that is written down before you begin and then followed. It is to be written in ink in the lab notebook. Press firmly. The **carbon copy** must be turned in at the end of the lab period.

**Sections VII-X** will be referred to as the Post-Lab. These sections may be typed and printed outside of lab. The Post-Lab is due by 8:30 PM two days after completion of the lab. (Example: The reports of Monday sections are due on Wednesday by 8:30 PM.) Completion of the lab includes all data collection such as masses and melting ranges. If a sample is left to dry until the next lab period, or other parts are to be completed in the next lab period, the lab report will be due two days after the work is completed. Your TA will describe the procedure for turning in this section of the report.



#### XIV. Weekly Lab Schedule and Information:

**NOTE:** Few lab manuals are perfect. Sometimes adjustments in procedure need to be made for the best results. Sometimes safer reagents are substituted for those in the lab manual. The syllabus describes most of these changes, but additional changes may sometimes be necessary. It is the responsibility of the student to make note of any such change when given by the TA.

The order in which the experiments are performed in the lab may not be the same as the order in the manual. Always refer to the syllabus each week and carefully read all information related to the experiment. More information about each reaction can always be found in the appropriate chapter of the Wade textbook.

**SPECIAL NOTE:** Arriving to lab on time is important. For safety reasons, if you are more than 15 minutes late, you may not perform the experiment. Ask the lab coordinator if a make-up lab is possible.

**General Note:** Often post lab questions in the manual ask about limiting reagent, theoretical yield, % yield, and certain observations and conclusions in the experiment. These are not assigned as postlab questions, because this information is always required in other sections of the report.

**Dates given in the schedule:** This syllabus is used for lab sections meeting throughout the week. Tuesday sections will be the first lab to perform the new experiment and Monday sections will be the last sections to perform any experiment. For example, when lab work is designated for January 16-22, it does not mean that a student can choose any day in that week to do the work. Students in Tuesday sections will do the work on January 16. Students in Monday sections will do the work on January 22. Always pay careful attention to the dates given in the syllabus.

Jan. 17-23      Orientation, check-in. Wash glassware if necessary and watch film on safety.

Jan. 24-30      **Remember to bring your lab coat, goggles, lab manual, and lab notebook. You will not be allowed to participate without the proper shoes, lab coat, covered legs, and goggles. If you did not bring a lock on the first day (check-in), you must have a lock by today. Your lock will not be unlocked unless you have a replacement lock of your own.**

**Remember to bring the completed pre-lab sections (sections I-V) to hand in.**

**Prelaboratory preparation:** Read "Safety Guidelines", p. 1.  
Review pp. 460-467 and 494-496 of chapter 11 in Wade.

Read "Oxidizing Methoxybenzyl Alcohol to Methoxybenzaldehyde Using Phase-Transfer Catalysis", pp. 217-229 in the lab manual.

**Prelab Questions:** 1-5, pp.231-232.

The semi-microscale procedure will be performed. TLC to determine the reaction time will be omitted. The reaction mixture will be stirred for 45 minutes. After the product is isolated, you will learn to use the FT – IR to obtain the IR spectrum of the product.

Always be sure to turn in any spectra acquired with your lab report.

**Postlab Questions:** 3, 4, 6, and 7 p. 230.

Jan. 31-Feb.6 Review section 11 of Chapter 10 in Wade. Read “Reducing Benzil Using Sodium Borohydride”, pp. 197-208 of the lab manual.

**Prelab Questions:** Answer questions 1 – 6 on pp. 211-213.

Reducing Benzil: The semi-microscale procedure as written will be used to reduce benzil. Methods 1, 3, and 4 will be used to identify the product.

**NOTE:** Sketch any TLC plates obtained in this lab and subsequent labs to scale in your notebook. Rulers will be provided. All TLC plates must be turned in at the end of lab. Place them in the plastic bag provided and label the bag with your name and ID#. Give the bag to your TA. An evaluation of these plates for appropriate sample application and concentration, proper marking of developed spots, and correct R<sub>f</sub> values will contribute to the grade.

**Post-lab questions:** Questions 1, 2, 3(only the techniques used), and 5 on page 209. Question #4 should be answered in the Calculations section of your lab report.

Feb. 7-13 Two Methods for the Synthesis of Phenacetin, pp. 233-245. Only the semi-microscale Williamson Ether Synthesis will be performed.

**Prelab Questions:** 1, 3, 4, pp. 249-250.

**Postlab Questions:** 4,5; p. 248.

Feb. 14-20 The Diels-Alder Reaction of Anthracene and Maleic Anhydride

A handout will be substituted for the Diels-Alder reaction in the lab manual. It will be provided by the TA. The semi-microscale procedure will be performed.

Answer all pre and post-lab questions in the handout.

Feb. 21-27 Nitrating Acetanilide or Methyl Benzoate: Electrophilic Aromatic Substitution, pp. 269-276. Both nitrations will be performed and the substitutions will be compared.

**Prelab Questions:** 1, 2, p. 279.

**Postlab Questions:** 1c, 1d, 2,3, p. 277.

Feb. 28-Mar. 5 Nucleophilic Aromatic Substitution: The Reaction of 3,4-Dichloronitrobenzene with Sodium Methoxide, pp. 281-289. The semi-microscale procedure will be performed.

**Prelab Questions:** 1-4, p. 293.

**Postlab Questions:** 4-6, p. 291.

Mar. 6-9,18,19 Classification and Identification of Aldehydes and Ketones, pp. 295-302.

**Prelab questions:** 1-4, p. 304.

You will perform the 4 classification tests on the known compounds given in Table 3 on p. 299 with one exception and on an unknown compound. Instead of cyclohexanone, 3-pentanone will be used in the classification tests. For the Tollen’s Test, the solvent bis-(2-ethoxyethyl) ether will be omitted. Carefully record all observations in your notebook.

When performing the 2,4-DNP test (test 4) on the unknown, you will use the quantities and procedure given on p. 300 in the "Formation of Derivatives" section, #4. From this 2,4-dinitrophenylhydrazone derivative, you will determine the identity of the unknown.

**Post-lab questions:** 1-4, p. 306.

Mar. 11-16 Spring Break!

Mar. 20-26 Synthesis of Trans-9-(2-Phenylethenyl)Anthracene: A Wittig Reaction, pp. 307-317. The microscale procedure will be performed.

**Prelab Questions:** 1, 2, 4, pp. 319-320.

**Postlab Questions:** 2-5, p. 317.

Mar. 27-Apr. 2 Esterification and Hydrolysis, pp. 333-346. **Prelab Question:** Exercise in gray box on p. 333.

Procedure 4 on p. 342 will be used to prepare Methyl Salicylate (oil of wintergreen) rather than Methyl Benzoate (no aroma, so no fun).

**Procedure Modifications:**

1. 10.0 g of salicylic acid and 40 mL of methanol are used instead of 10.0 g of benzoic acid and 25 mL of methanol.
2. After the 1 hour reflux, the cooled solution is decanted into a separatory funnel containing 30 mL of water instead of 50 mL of water.
3. t-butyl methyl ether (TBME) is used for extraction.
4. The TBME layer is washed twice with sodium bicarbonate instead of once.
5. The TBME layer is dried over sodium sulfate instead of calcium chloride.
6. The dried TBME is decanted into a pre-weighed 250 mL round bottom flask and removed by rotary evaporator. The methyl salicylate is not distilled.
7. Record the color, odor, and mass. Calculate % yield. Obtain IR and NMR.
8. TLC is performed using methanol as the solvent and dichloromethane as the eluent. (Remember to sketch the plate in your notebook and turn it in to your TA as described earlier.)

**Postlab Questions:** 1-3, p. 344.

Apr. 3-9 Cannizzaro Reaction: The Conversion of p-Nitrobenzaldehyde into p-Nitrobenzoic Acid and p-Nitrobenzyl Alcohol, pp. 321-327.

**Prelab Questions:** 1-5, pp. 331-332.

**Procedure Modifications:**

Part 1: The reaction is performed in an 18mm test tube with a glass rod for stirring as in Note 2 in the manual.

Part 5: The eluent for TLC is 10% methanol/dichloromethane. (Remember to sketch the plate in your notebook and turn it in to your TA as described earlier.)

**Postlab Questions:** 2,3 on p. 329.

Apr. 10-16 A Multistep Synthesis Sequence: An Aldol Condensation, A Michael Addition, and Ethylene Ketal Formation, pp. 347-366. Only the Aldol Condensation and Michael Addition will be performed. The semi-microscale procedures will be performed.

**Prelab Questions:** 1, 3, 4; pp 365-366.

**Postlab Question:** 5, p. 364.

**Important Note:** If time permits, wash all glassware and make sure that all of the necessary equipment is in your drawer for check-out next week. It is your responsibility to replace anything lost or broken during the semester by purchasing at the NSM Research Store.

Apr. 17-23 Final Exam (Cumulative) and Check-out.

On the following pages you will find syllabus language required and recommended by the University of Houston. All may not apply to the lab.

## XV. Required Language for Courses with a Face-to-Face Component:

If you are experiencing any COVID-19 symptoms that are not clearly related to a pre-existing medical condition, do not come to class. Please see [Student Protocols](#) for what to do if you experience symptoms and [Potential Exposure to Coronavirus](#) for what to do if you have potentially been exposed to COVID-19. Consult the (select: [Undergraduate Excused Absence Policy](#) or [Graduate Excused Absence Policy](#)) for information regarding excused absences due to medical reasons.

## XVI. Required Language for All Courses:

### COVID-19 Information

Students are encouraged to visit the University's [COVID-19](#) website for important information including diagnosis and symptom protocols, on-campus testing, and vaccine information. Please check the website throughout the semester for updates.

### Vaccinations

Data suggests that vaccination remains the best intervention for reliable protection against COVID-19. Students are asked to familiarize themselves with pertinent [vaccine information](#) and to consult with their health care provider. The University strongly encourages all students, faculty and staff to be vaccinated.

### Reasonable Academic Adjustments/Auxiliary Aids

The University of Houston complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for disabled students. In accordance with Section 504 and ADA guidelines, UH strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please contact [the Justin Dart Jr. Student Accessibility Center](#) (formerly the Justin Dart, Jr. Center for Students with DisABILITIES).

### Excused Absence Policy

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston [Undergraduate Excused Absence Policy](#) and [Graduate Excused Absence Policy](#) for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make

up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to [military service](#), [religious holy days](#), [pregnancy and related conditions](#), and [disability](#).

#### Recording of Class

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the [Justin Dart, Jr. Student Accessibility Center](#). If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with *anyone* without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

#### Syllabus Changes

Due to the changing nature of the COVID-19 pandemic, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible through email.

## **XVII. Recommended Language for All Courses:**

#### Resources for Online Learning

The University of Houston is committed to student success, and provides information to optimize the online learning experience through our [Power-On](#) website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, and Blackboard; requesting a laptop through the Laptop Loaner Program; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact [UHOnline@uh.edu](mailto:UHOnline@uh.edu).

#### UH Email

Please check and use your CougarNet email for communications related to this course. To access this email, [login](#) to your Microsoft 365 account with your CougarNet credentials.

**Added by Mary Bean:** If I contact individuals or the whole lab section, I will use the uh.edu email addresses provided by the peoplesoft roster of the class.

#### Academic Honesty Policy

High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The [UH Academic Honesty Policy](#) is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

### Title IX/Sexual Misconduct

Per the UHS Sexual Misconduct Policy, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office. Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the Title IX website at <https://uh.edu/equal-opportunity/title-ix-sexual-misconduct/resources/>.

### Security Escorts and Cougar Ride

UHPD continually works with the University community to make the campus a safe place to learn, work, and live. Our Security escort service is designed for the community members who have safety concerns and would like to have a Security Officer walk with them, for their safety, as they make their way across campus. Based on availability either a UHPD Security Officer or Police Officer will escort students, faculty, and staff to locations beginning and ending on campus. If you feel that you need a Security Officer to walk with you for your safety please call [713-743-3333](tel:713-743-3333). Arrangements may be made for special needs.

Parking and Transportation Services also offers a late-night, on-demand shuttle service called Cougar Ride that provides rides to and from all on-campus shuttle stops, as well as the MD Anderson Library, Cougar Village/Moody Towers and the UH Technology Bridge. Rides can be requested through the UH Go app. Days and hours of operation can be found at <https://uh.edu/af-university-services/parking/cougar-ride/>.

### **Helpful Information**

**Coogs Care:** <https://uh.edu/dsa/coogscare/>

**Student Health Center:** <https://www.uh.edu/healthcenter/>  
<https://www.uh.edu/healthcenter/>