

SYLLABUS FOR CHEMISTRY 2181 (Summer I, 2012)
ORGANIC CHEMISTRY LABORATORY 1

Section 1 in CPB 203; Section 2 in CPB 205; Section 3 in CPB 203

Monday/Wednesday BRIEFINGS ARE IN ROOM SH 125
Tuesday/Thursday BRIEFINGS ARE IN ROOM SH 205

Dr. Mandal (CPB 349, Tel. 817-272-3804, e-mail: smandal@uta.edu) is the coordinator for CHEM 2181 Summer I (5 weeks). Dr. Mandal's office hours are 12:30-1:30 PM Tuesday and Thursday and by appointment only. Details regarding the course can be found at www.uta.edu/chemistry and navigating from there.

The pre-requisite for this course is CHEM 1442 or equivalent. Students enrolled in CHEM 2181 must also be enrolled in CHEM 2321 or have prior credit for CHEM 2321 or an equivalent course. Others will be dropped from 2181. Students enrolling in 2181 with the intention of replacing a previous 2181 grade must declare their intention to do so at the registrar's office by the census date (June 7) for this semester. If you are dropped from this class for non-payment of tuition, you may secure an Enrollment Loan through the Bursar's Office. **You may not continue to attend class until your Enrollment Loan has been applied to outstanding tuition fees.**

This course is intended to familiarize you with many common procedures and techniques for preparing, identifying, and purifying organic compounds. On completion of this course it is expected that you will:

- a.) know how to correctly assemble and operate common laboratory glassware and equipment required for the synthesis, purification, and identification of organic compounds.
- b.) demonstrate habits of careful workmanship in the laboratory, including skills of observation, measurement, and record-keeping.
- c.) perform laboratory work in accordance with accepted regulations with due regard for your own and others' safety.

The laboratory manual is *Experiments for Organic Chemistry I*. You should read and be familiar with all of the assigned experiments **before** they are scheduled to be performed. You should also complete the appropriate pre-lab exercises in your notebook **before** starting the experiments. You will be taking a brief quiz **before** starting an experiment. You will not be expected to answer questions or do any procedures involving spectroscopy, i.e. NMR and IR, this semester.

Required Lab Attire: IMPORTANT! You will be exposed to hazardous chemicals in this class. Personal protective equipment (PPE) is necessary to protect your body. You will not be admitted into the lab if any of the following guidelines are not met. If you violate any of the following guidelines, you may be asked to leave the lab. All missed work will receive zero credit.

1. Goggles, gloves and aprons are provided and are required at all times.
2. Shoes that cover the entire foot are required at all times. No sandals, Crocs, etc, even with socks. *Absolutely no exceptions will be made to this guideline. Warnings will not be issued.*
3. Long pants and sleeves are highly recommended.
4. Contact lenses should not be worn in the lab.
5. No musical or other entertainment devices may be used in chemistry lab at any time.
6. Cell phones are not permitted in lab and must be put in your bag before you enter lab.

Mandatory Online Safety Training: Students registered for this course must complete the University's required "Lab Safety Training" prior to entering the lab and undertaking any activities. Students will be notified via MavMail when their online training is available. Once notified, students should complete the required module as soon as possible, but no later than their first lab meeting. Until all required Lab Safety Training is completed, a student will not be given access to lab facilities, will not be able to participate in any lab activities, and will earn a grade of zero for any uncompleted work.

1. You should have received an email from the UTA Compliance Department. Click on the link in the email (or navigate to <https://training.uta.edu> for the login page)
2. Log on using your network log-on ID and password (what you use to access email). If you do not know your NetID or need to reset your password, visit <http://oit.uta.edu/cs/accounts/student/netid/netid.html>.
3. The available courses for completion will be listed. For Chemistry 1441, complete the course entitled 'Student Lab Safety Training'
4. If you did not receive the training email and you have not already completed the training you will need to contact the training helpline (817-272-5100) or email compliance@uta.edu.
5. Students who have not completed the training by census date may be dropped from the lab (and consequently the lecture).

Once completed, Lab Safety Training is valid for the remainder of the same academic year (i.e. through next August) for all courses that include a lab. If a student enrolls in a lab course in a subsequent academic year, he/she must complete the required training again.

All questions/problems with online training should be directed to the University Compliance Services Training Helpline at 817-272-5100 or by emailing compliance@uta.edu.

Notebook: A **hard-bound notebook** (not spiral-bound) is required. The notebook should be kept in **ink**. The pages should be numbered sequentially, and there must be a table of contents at the beginning. Each experiment must include the date the work is done, a title, and a main equation or object of the experiment.

THE FOLLOWING ITEMS SHOULD BE WRITTEN IN THE NOTEBOOK BEFORE COMING TO THE LAB

1. Title of the experiment and date.
2. Balanced equation(s) for any reactions.
3. Data for all reactants: molecular weights, moles and grams/volume used, physical constants and calculation of limiting reagent.
4. Sketch and names of apparatus used in experiment.
5. OUTLINE THE EXPERIMENT IN SUFFICIENT DETAIL THAT THE EXPERIMENT CAN BE CONDUCTED WITHOUT YOUR LAB TEXT. Carefully note items related to safety. Include a separation scheme for work-up of the product where appropriate. **Each experiment must be conducted from the outline you have written in your notebook.**
6. Calculate the theoretical yield of your product (show calculations).
7. Answer assigned questions.

DURING THE LAB:

8. Record what you do and observe during the experiment. Weights are to be recorded using the Tare + compound - Tare = weight, unless you use an automatic tare. If using an automatic Tare, record this in your notebook. The boiling point or melting point **range** is to be recorded.

AFTER THE LAB

9. Calculate the percent yield (show all calculations).
10. Conclusion: Comment about or discuss any part of the experiment you think appropriate (e.g., an explanation of why the yield is too low, a suggestion for improving some part of the experiment, etc.).

A SHORT QUIZ WILL BE GIVEN ON EACH EXPERIMENT AND ASSOCIATED TECHNIQUES PRIOR TO THE BRIEFING FOR THE EXPERIMENT. PRE-LAB EXERCISES MUST BE FINISHED AND STAPLED IN YOUR NOTEBOOK BEFORE YOU BEGIN THE EXPERIMENT.

Notebooks will be taken up for grading (unannounced) two or three times during the semester. Your notebooks will also be examined by the TAs periodically to insure you are complying with 1-7 above.

Grading: Practical I (20%), Practical II (20%), Other Experiments (20%), Notebook (Pre-lab Exercises are 25% of the notebook grade) (15%), Quizzes (15%), Final Exam (10%). Course grades: 90% or >-A, 89-80%-B, 79-70%-C, 69-60%-D, <60%-F.

Make-ups are allowed only for practicals and only for students who have an excused absence. Make-ups are not allowed for non-practical experiments. If a non-practical is missed, there is a deduction of 10% of the 15% designated for other experiments. Missing more than one experiment will result in an incomplete or failing grade in the course. There will be a 15 point deduction for any practical that is started over.

All equipment on temporary loan from the Stockroom must be returned the same day it is checked out.

Note: If you decide to drop or stop attending the lab, YOU need to:

Contact the Chemistry Stockroom, 112 CPB, to check out on or before the scheduled check-out date. Drop the class with your advisor.

Students must check-out on the assigned day, unless they have a legitimate, verifiable excuse. Students failing to check-out on the assigned day will receive a point penalty of 10% of the 15% allotted for other experiments. If check-out is still not complete one week after the assigned date, the stockroom will check out the student and assess a \$30 check-out fee, a \$30 key fee, and the cost of any broken, missing or excessively dirty glassware.

All fees are non-refundable once they have been billed.

UTA will bill your account and it will have to be paid before you will be allowed to register for the next semester. This will show up on your tuition bill as “chemical breakage.”

Schedule: Dates for sections 001 and 002 first, 003 last.

Jun 4,5 Students and lab briefing and check into the lab drawer.

Instructor: Discuss lab routine and notebook format in the classroom. Assign and distribute Experiment “Separation of Spinach Pigments by TLC,” pp. 180-182. In the lab, demonstrate the use of the fire extinguisher, eye wash, and safety shower.

Students: Check equipment and replace any missing or damaged pieces from the Stockroom. Remember, you are responsible for equipment being in good condition when it is checked back in at semester’s end.

Do Experiment: Determination of Melting points

Jun 6,7 Separation of Spinach Pigments by TLC. Handout, pp.180-182. Read pp. 175-180 for background. Work in groups of four--one solvent per student.

Jun 11,12 Recrystallization

Jun 13,14 Separation of a Mixture by Acid-Base Extraction

June 18,9 Cyclohexene--Dehydration of Cyclohexanol

June 20, 21 **Practical I:** SN1 Reactivity

***Jun 25* Last day to drop**

Jun 25,26 **Complete Practical I.** Determine the weight of your product and compute the yield. **Begin Practical II.** Resolution of Racemic 1-Phenylethanamine (Handout). Chap. 7, pp. 226-228. Read pp. 223-226 for background. Read pertinent sections of Chap. 2 as given on p. 227. **We will work this experiment on ½ scale from the handout and since the measurement of the optical rotation of the racemic material at the beginning is omitted, you will need to use 6.25 g of the racemate in 125 mL of methanol.** There should be no communication with other students in the lab. Direct all questions to your TA.

Jun 27, 28 **Complete Practical II.** Compute your yield and turn in your product to your instructor.

July 2, 3 Bromination of (*E*)-cinnamic acid.

July 4 Independence Day (Holiday).

July 5 Practical make-up day, only one practical can be made up. All requests for practical make-ups must get approval from Dr. Mandal before June 29 and the application form can be obtained from Dr. William Cleaver.

Check out when done. Broken and excessively dirty or lost equipment must be replaced.

July 9 **Final Examination, Mon 1-3 p.m.** Room 114 CRB. Exam will emphasize procedures and techniques. Bring a Scantron form 882 ES to the examination. **NOTE: BRING YOUR LAB NOTEBOOK TO THE EXAM!**

Students with Disabilities: Students who need an accommodation based on disability should arrange to meet with the laboratory coordinator in his office during the first week of the semester to see that they are appropriately accommodated.

Students with Pregnancies: For students who are pregnant, it is recommended by the Chemistry and Biochemistry Dept. that you do not enroll into a chemistry lab at this time. If you become pregnant during the semester, we recommend dropping the course as soon as possible; and special provisions will be made to assist you in finishing the course at a later date. ***Please see your faculty instructor for assistance.***

Academic dishonesty: UTA considers academic dishonesty a completely unacceptable mode of conduct, and the University will not tolerate it in any form. Academic dishonesty includes (but is not limited to) cheating, falsification of data, plagiarism, and contracting/collusion with others to do your test or do your work. Cheating is the use or acquisition of information (data, constants, formulas, textual material, etc.) from either unauthorized sources or in an unauthorized manner. Examples include but are not limited to

- a.) exchanging information during a test or quiz.
- b.) looking at another student's paper during a test or quiz.
- c.) bringing information in any form into a test or quiz other than personal knowledge. This includes written notes (crib sheets) and digitally stored information (formulas, constants, textual, etc.)
- d.) looking at a book or any other unauthorized source during the test or quiz.
- e.) accessing information by any electronic means (cellular phones, pages, personal stereos, etc.).

None of these items are to be brought into examinations.

- f.) processing data or information in an unauthorized manner using a programmable calculator or computer, i.e., there should be no use of a computer program. You are only permitted to use simple calculators which perform arithmetical, logarithmic, and trigonometric functions.

In the event that a test proctor determines that a student is cheating, the following actions will be taken:

- 1.) the student will be notified and, if the situation merits, asked to explain his/her actions.
- 2.) the source of the unauthorized information will be removed during the remainder of the test period and returned to the student following the test, if appropriate.
- 3.) the student may be removed to a different location to complete the test.
- 4.) calculator/computer memory will be cleared of the stored information and programs as appropriate. In some cases the proctor will need to temporarily examine the calculator to verify unauthorized use. The calculator will be returned to the student to finish the test.
- 5.) a record of the events and actions surrounding the alleged act of cheating will be submitted to the Associate Vice Provost for Student Affairs for further action. See Undergraduate Catalog for further information.

Following is a statement from the University policy on cheating. *“Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the University.”*