

CHEMISTRY 2181 – Spring 2013 ORGANIC CHEMISTRY LABORATORY 1

Section	Briefing	Laboratory	TA	Professor	Section	Briefing	Laboratory	TA	Professor
001 Monday 1-4:50 PM	SH 205	CPB 203	Jayaratna	Foss	005 Friday 1-4:50 PM	SH 315	CPB 203	Ray	Mandal
002 Tuesday 1-4:50 PM	SH 315	CPB 203	Parpia	Foss	006 Tuesday 8-11:50 AM	SH 315	CPB 203	Carter	Mandal
003 Wednesday 1-4:50 PM	SH 205	CPB 203	Carter	Foss	007 Wednesday 8-11:50 AM	SH 105	CPB 203	Jayaratna	Mandal
004 Thursday 1-4:50 PM	SH 105	CPB 203	Parpia	Foss	008 Thursday 6-9:50 PM	SH 205	CPB 203	Ray	Mandal

Dr. Frank W. Foss (202 CRB, 817-272-5245, ffoss@uta.edu) and Dr. Subhrangsu Mandal (CPB 349, 817-272-3804, smandal@uta.edu) are the coordinators for CHEM 2181. Information about various aspects of CHEM 2181, including office hours, will also be available on Blackboard (<http://www.uta.edu/blackboard/>). For reasons of web security, faculty, staff, and students **must** use their **official** UT Arlington e-mail address for all university-related business.

Pre-requisite for this course is CHEM 1442 or equivalent, with a grade of C or better. 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 Chem 2181. Students enrolling in Chem 2181 with the intention of replacing a previous Chem 2181 grade must declare their intention to do so at the registrar's office by the census date (January 30th) 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:

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

Laboratory manual is *Experiments for Organic Chemistry I*. Please read the PREFACE of the manual **prior** to coming into the lab for the first time. 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 take a brief online quiz **before** starting an each new experiment. You will not be expected to answer questions or do any procedures involving spectroscopy, i.e. NMR and IR, this semester. **NOTE: This is a new Laboratory Manual for this semester.**

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.

Accessing Online Training:

- 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)
- 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>.
- The available courses for completion will be listed. For Chemistry 2181, complete the course entitled 'Student Lab Safety Training'
- 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 any linked lecture).

Once completed, Lab Safety Training is valid for the remainder of the same academic year (i.e. through August) for all courses that include a lab. If a student enrolls in a laboratory 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.

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. Long hair should be tied back.
6. No musical or other entertainment devices may be used in chemistry lab at any time.
7. Cell phones are not permitted in lab and must be turned off and put in your bag before you enter lab.

Notebook: A **hard-bound notebook** (not spiral-bound) is required. The notebook must be kept **in ink**. The pages are to 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 reaction equation or object of the experiment.

Notebook Content:

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. Look up and note major hazard classes for each reagent used in the experiment, which can be found on each chemical's Material Safety Data Sheet (MSDS) online.
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.** Note items related to safety. Include a scheme for purification of the product, as needed. **Each experiment must be conducted from the outline you write in your notebook. No Lab Manuals are allowed during the performance of any laboratory experiment.**
6. Calculate the theoretical yield of your product (show calculations).
7. Answer assigned questions.

DURING THE LAB:

8. Record what you do and observe regarding your materials throughout the experiment. Raw data including weights are to be recorded. Record all three weights: Tare + Compound – Tare = Weight, unless you use an automatic tare. If using an automatic Tare, record this in your notebook. All boiling point or melting point **ranges** are 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.).

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.

Pre-Lab Quizzes will be given for each new experiment, which will be administered via Blackboard. The quiz must be completed **one hour before** your lab is scheduled to begin. Quizzes may be accessed for 24 hours prior to their due date. Failure to comply will result in the award of zero for that lab. Pre-lab exercises must be finished and stapled in your notebook before you begin the experiment.

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

Make-ups are allowed only for Practical I or II and only for students who have an excused absence. To schedule a make-up, obtain, complete, and obtain signatures for the approval paperwork before submitting it to Dr. Cleaver **before April 18th** at 4:00 PM. Make-ups are not allowed for non-practical experiments. If a non-practical is missed, there is a deduction of HALF of the 20% 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 must:

Contact the Chemistry Stockroom, 112 CPB, to check out on or before the scheduled check-out date.
Drop the class in the Chemistry Office, 130 CPB.

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 20% 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.”

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.

Schedule:

- Jan 14-18* Syllabus Overview and Lab Equipment Check-in
Instructor: Discuss lab routine and notebook format in the classroom. In the lab, demonstrate the location and use (without discharging) of the fire extinguisher, eyewash, and safety shower.
Students: Check out 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.
- January 21st* **Martin Luther King Day.** Section 001 will perform the TLC experiment on **April 22nd**. Section 001 students should read these assignments now. These techniques and theories are used extensively in organic experiments.
- Jan 22-25* Separation of Spinach Pigments by TLC. Work in groups of four--one solvent per student. **Section 001 will perform this experiment on April 22nd.**

<i>Jan 28-Feb 1</i>	Determination of Melting points
<i>January 30th</i>	<i>Census Date</i>
<i>Feb 4-8</i>	Recrystallization
<i>Feb 11-15</i>	Distillation and Gas-Liquid Chromatography (GLC)
<i>Feb 18-22</i>	Separation of a Mixture by Acid-Base Extraction
<i>Feb 25-Mar 1</i>	<p>Practical I. Resolution of Racemic 1-Phenylethanamine There should be <u>no communication</u> with other students in the lab. Direct all questions to your TA. Also: Attend a presentation on chemical literature – details will be provided closer to this presentation.</p>
<i>Mar 4-8</i>	Complete Practical I. Determine the weight of your product, compute the %-yield and determine the specific rotation.
<i>Mar 11-15</i>	<i>Spring Break</i>
<i>Mar 18-22</i>	Cyclohexene--Dehydration of Cyclohexanol
<i>Mar 25-29</i>	Oxidative Cleavage of Alkenes
<i>March 29th</i>	<i>Last day to drop</i>
<i>Apr 1-5</i>	<p>Practical II. S_N1 Reactivity There should be <u>no communication</u> with other students in the lab. Direct all questions to your TA.</p>
<i>Apr 8-12</i>	Complete Practical II. Compute your yield and turn in your product to your instructor.
<i>Apr 15-19</i>	Bromination of (<i>E</i>)-cinnamic acid.
<i>Apr 22/23</i>	<p>Section 001 does the Separation of Spinach Pigments by TLC experiment. <u>Excused</u>, missed Practical Experiments may be made up on April 23rd.</p>
<i>Apr 29-May 3</i>	Check out of lab during class time. Broken and excessively dirty or lost equipment must be replaced.
<i>May 9th</i>	<p>Final Examination, Thursday 5:30-8:00 p.m. Either Room 100 or 101 Science Hall. Exam will emphasize procedures and techniques. <u>Bring a Scantron form 882 ES and pencil to the examination.</u> <u>BRING YOUR LAB NOTEBOOK TO THE EXAM!</u></p>

Academic Integrity: All students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

Instructors may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Academic dishonesty: 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 that 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.