



UNIVERSITY OF
CALGARY

UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY
WINTER 2019

1. **Course:** CHEM 555, Advanced Organic Laboratory

Lecture Section: L01

M, 13:00-13:50, ST 027, Dr. Van Humbeck (SB 229A, 403.220.3039, jeffrey.vanhumbec1@ucalgary.ca)

Office hours: By appointment

Chemistry Department Office: Science A 229, 403.220.5341, chem.info@ucalgary.ca

It is recommended that students use their U of C account for all correspondences.

D2L: CHEM 555 L01-(Winter 2019)-Advanced Organic Laboratory

2. **Course Description**

This course is designed with a single goal in mind: to provide undergraduate students with exposure to advanced laboratory techniques. This is accomplished in the context of four experiments focused on the production of specific synthetic targets. The schedule for Winter 2019 will be as outlined below:

NMR Training: January 16th

Experiment #1 (1,1-Diphenyl-1-buten-3-one): January 18th/23rd/25th/30th

Experiment #1 flex days/Experiment #2 pre-lab purifications: February 1st/6th

Experiment #2 (*trans*-2-Phenylcyclohexanol): February 8th/13th/15th/27th March 1st

Experiment #2 flex days/Experiment #3 pre-lab purifications: March 6th/8th

Experiment #3 (Carpanone): March 13th/20th/22nd/29th

Experiment #3 flex days/Experiment #4 pre-lab identification: March 15th/27th

Experiment #4 (substituted Ethyl cinnamates): April 3rd

Lab Practical Exam: April 5th/10th

Check-Out: April 12th

3. **Laboratory errors, flex days, and collaborative grading**

When pursuing synthetic targets through multi-step synthesis, it may be the case that experimental errors lead to low yields. At some point, an individual student may not have enough of an advanced intermediate to successfully complete the synthesis. When this happens, the student will alert the lab TA. The TA will then make the decision about which course of the following is pursued:

(i) Each experiment has some 'flex' time baked into the schedule. If enough time remains in the experiment, the student will begin the experiment again.

(ii) If enough time does not remain to re-start the experiment, the student without enough material will be paired with the student having the most material. At this point, those students will begin generating their 'Laboratory Collaboration' grade.

Collaborative work instructions and grading rubric

When two students are combined into a team, the following two factors underlie the collaboration:

- (i) The student donating the material is providing a significant service, and given that their material will be used, they will be designated as the 'team lead'.
- (ii) Everyone makes mistakes. The student who happened to lose their material should still be intimately involved in the rest of the experiment.

Both students working in the team will be provided a collaboration grade for that experiment based on the observations of the TAs. The following characteristics would broadly define the type of grade that should be expected. Partial grades (+ or –) can be assigned to reflect smaller differences:

A: The team lead divides the work fairly and efficiently. Both students are engaged and involved in all aspects of the remainder of the experiment. The second student performs the tasks assigned by the lead without complaint and to the best of their ability.

B: Some friction in the team. The team lead somewhat sidelines the second student by not assigning them meaningful work, or the second student is somewhat uncooperative in doing the work they have been assigned. Minor intervention by the TA is needed to keep the team moving forward.

C: Significant friction in the team. The team lead consistently sidelines the second student by not assigning meaningful work, or the second student is consistently uncooperative. Ongoing intervention is needed by the TA to keep the team moving forward.

F: The TA deems it necessary to separate the students.

The collaborative grade for each student will be the simple average of the collaborative grades they receive during the semester. If it happens that any particular student does not participate in a team during the semester, the 10% grade assigned to this component will be pro-rated across the other course components.

4. Lecture Participation

It is expected that students will come to the Monday lectures completely prepared for the laboratory experiments that will take place the following Wednesday and Friday. The first half of each lecture will involve discussion of the previous weeks' results, while the second half will be looking forward to the upcoming week. Given the small size of this class, it is expected that all students participate in the discussion. Each week, a grade of + (100%), O (75%), or – (50%) will be assigned based on the students' discussion involvement and level of preparation. Students will be allowed to miss one lecture discussion without documentation. The second (and any subsequent) absences will require documentation as per the Course Outline to be excused, or a grade of zero will be assigned for that lecture.

ALL OTHER CRITICAL COURSE INFORMATION CAN BE FOUND ON THE OFFICIAL COURSE INFORMATION SHEET

Department Approva: Approved by Department Head

Date: January 7, 2019