

SYLLABUS¹

CHEM 2125 – ORGANIC CHEMISTRY LABORATORY II Summer 2011

Professor: Dr. Sergio Cortes
Phone: 972-883-6801
Email: scortes@utdallas.edu

Office: SLC 3.509
Hours: TBA
Website: utdallas.edu/~scortes/ochem

COURSE PREREQUISITES: Organic Chemistry I (lecture and laboratory) and associated prerequisites
COURSE COREQUISITES: Organic Chemistry II

COURSE DESCRIPTION

This course is designed to provide the skills necessary to conceptualize, design, and execute organic experiments with an emphasis on syntheses. Students gain exposure to representative types of organic transformations and mechanisms, spectroscopy and structure determination, and the use of the chemical literature. Correlation with the lecture course is adequate, but practical factors prevent full overlap.

LEARNING OBJECTIVES AND OUTCOMES

- Learn to use the organic chemistry literature & scientific databases for research.
- Perform representative reaction types, either in isolation or as part of a synthesis. These include, but are not limited to, oxidations, reductions, aromatic substitutions, and select name reactions.
- Use spectroscopic techniques such as IR and NMR to characterize organic substances.

TEXTBOOK AND MATERIALS

TEXTBOOK: Pavia, Lampman, Kriz, and Engel. *Introduction to Organic Laboratory Techniques: A Microscale Approach*. 4th ed. Thomson Brooks/Cole, 2007.

SUPPLIES – The combination padlock is required for check-in, so it must be obtained by the check-in date (see schedule on the next page). The rest of the supplies must be obtained by the date of the first experiment. The notebook can be obtained from the on/off-campus bookstores. Safety glasses can be obtained from the bookstores or from the Chemistry Student Association, room BE 3.518 (about \$5).

- COMBINATION PADLOCK for your drawer. Only **one per group** is required.
- HARDBOUND NOTEBOOK with duplicate sheets (carbon copies)
- APPROVED SAFETY GLASSES: **Must have the Z87 code engraved on them. The spectacle type is recommended over the goggle type.** Spectacles look like regular glasses, are comfortable, and can be worn over prescription glasses. **Goggles are uncomfortable**, promote sweating, and fog up, thereby impairing vision. For more details go to the [CNA services](#) website.
- DISHWASHING GLOVES: Can be obtained at any store.
- PROTECTIVE CLOTHING: **A lab coat is strongly recommended.** Coats can be obtained at retail outlets such as Sears, and at most uniform and medical supplies stores (scrubs are OK too).
- ITEMS OF PERSONAL USE (one per group): Towel, sponge pack for cleaning, tweezers, marker or pen, and masking tape for labeling.

¹ The descriptions and timelines presented in this syllabus are subject to change at the discretion of the Professor.

CLASS SCHEDULE – Org. Lab II – Summer 2011

Detailed descriptions follow below the table

EXPERIMENT SCHEDULE	
May 23, 24	NO CLASS / NO LABS
May 25, 26	Introduction & Library Assignments
June 1, 2	Check-in, Library Instruction (See schedule below)
June 6 – 9	Exp. 38 A: Grignard Reaction First library assignment due June 8/9
June 13 – 16	Exp. 36 B,C: Synthesis of Benzilic Acid Second library assignment due June 15/16
June 20, 21	Exp. 45: Preparation of Benzocaine
June 22, 23	Exp. 45: NMR Analysis
June 27, 28	Exp. 65: Esterification of Vanillin
June 29, 30	Exp. 65: NMR Analysis
July 5 – 11	Exp. 48 A,B: Synthesis of Sulfanilamide
July 12 – 18	Exp. 43 A,B: Enamine Synthesis Glassware cleanup
July 19, 20	Check-out (Mandatory. See p. 3)

DETAILED DESCRIPTIONS, READINGS, & ASSIGNMENTS

INTRODUCTION – Course preview and general information.

Assignments: [Chemical Literature Exercises](#): Obtain from the instructor's website. These exercises are to be completed after attending the library lecture (see below). Each exercise counts as a separate report, worth 100 points, and due on the dates indicated above.

CHECK- IN/ LIBRARY INSTRUCTION: Intro to the chemical literature & use of scientific databases.

CHECK-IN AND LIBRARY INSTRUCTION SCHEDULE

SECTION	DATE	CHECK-IN Report to lab	LIBRARY INSTRUCTION Report to library lobby
1U1 (MW afternoon)	June 1	1:30 pm	3:00 pm
1U2 (TR morning)	June 2	8:30 am	10:00 am
1U3 & 1U4 (TR afternoon)	June 2	1:30 pm	3:00 pm

EXP. 38 A – PREPARATION OF TRIPHENYLMETHANOL. Grignard reactions, use of carbon nucleophiles in organic synthesis, solid IR spectroscopy.

- Readings: Posted notes and p. 317 – 324.
- Suggested study questions from the textbook (see note below): # 1, 3 (p. 327).
- **First library assignment due the first week of this experiment in lab.**

NOTE: The suggested study questions will get you started thinking about what you are supposed to learn from an experiment, but you won't be able to answer them before doing the experiment. They might however appear as part of the post-lab that you're required to turn in at the end of the lab session. Giving these questions some thought ahead of time will make it easier and faster to answer the post-lab.

EXP. 36 B, C – SYNTHESIS OF BENZILIC ACID. Organic oxidations and reductions, simple multistep synthesis, skeletal rearrangements, solid IR spectroscopy.

- Readings: p. 309 – 314.
- Suggested study questions from the textbook: # 1 and 2(a,c) (p. 314).
- **Second library assignment due the first week of this experiment in lab.**

EXP. 45 – PREPARATION OF BENZOCAINE. Local anesthetics, controlled conditions esterification, use of high field NMR for product characterization.

- Readings: p. 367 – 373.
- Suggested study questions from the textbook: # 1 – 4, p. 373.

EXP. 65 – ACID AND BASE CATALYZED ESTERIFICATION OF VANILLIN. Use of the chemical literature and NMR to solve a structure proof problem.

- Readings: Posted notes and p. 536 – 538.
- Obtain the following article and read it: Kochlar, S.K. *et. al. J. Org. Chem.*, **48**, 1765 – 1767 (1983).
Please consult your instructor or a reference librarian if help is needed.

EXP 48 A, B – PREPARATION OF SULFANILAMIDE. Sulfa drugs, protecting groups, aromatic substitution.

- Readings: Posted notes and p. 388 – 396
- Suggested study questions from the textbook: # 3, p. 396.

EXP. 43 A, B – ENAMINE REACTIONS. Preparation of 2-Acetylcyclohexanone: Enamine acylations, azeotropic distillation, keto-enol tautomerism.

- Readings: Posted notes and p. 348 – 356
- Suggested study questions from the textbook: # 2a, 2b, and 3a, p. 356.

CHECKOUT. Attendance to checkout is mandatory and carries a non-droppable grade equivalent to an experiment. The following applies:

- Failure to attend check out may result in charges to your account and a hold on your records.
- Being late or leaving before your group checks-out carries the same penalty as an absence.
- No checkout is allowed prior to the designated date (see page 2) unless you drop the course.

GRADING

The final grade for this course is based on the three items and their detailed descriptions listed below. One prelab grade and one experiment grade (not necessarily for the same experiment) will be dropped at semester end. All prelabs, post-labs, and assignments are graded on a 100 pt. scale.

- Individual prelabs 45%
- Group post-labs, individual assignments, Check-out 45%
- General technique 10%

INDIVIDUAL PRELABS are required prior to the performance of every experiment and are due on the day of the experiment at the start of the lab session. Please refer to the guidelines for writing prelabs that will post in *eLearning* for additional detail.

GROUP POST-LABS consist of a form to be filled out and turned in after completion of the experiment. They represent the work of a group and therefore the grade applies to all members of the group.

INDIVIDUAL ASSIGNMENTS. These are individual write-ups intended to be done outside the lab, and handed in during lab time at the beginning of the lab session. Please see page 2 for due dates.

GENERAL TECHNIQUE. This category includes, but is not limited to, the following:

- Observing safety rules (wearing eye protection, handling harmful chemicals in the hood, etc.).
- General degree of preparedness, ability to follow experimental procedure independently, and ability to complete the experiment within the allocated time period.
- Neatness in conducting experiments and cleaning up afterwards.
- Quality of group work, including fair participation by all members in all tasks and ability to motivate fellow group members to do their best.

LETTER GRADE ASSIGNMENT TABLE (based on final percent grade after round-off)

95 - 100 = A+	80 - 84 = B+	65 - 69 = C+	50 - 54 = D+
90 - 94 = A	75 - 79 = B	60 - 64 = C	45 - 49 = D
85 - 89 = A-	70 - 74 = B-	55 - 59 = C-	40 - 44 = D-

POLICY REGARDING MISSED EXPERIMENTS

- All incomplete experiments count as missed experiments. If you work in a group, all members must be present during the entire experiment. Leaving before the group finishes the experiment will void the entire experiment for the absent member.
- **TWO-PERIOD EXPERIMENTS:**
 - If you miss the first period of a 2-period experiment, you miss the entire experiment.
 - If you miss the second period of a 2-period experiment you get 50% off the experiment grade.
- The **FIRST** missed experiment will be dropped without penalty. **This is your allowance for emergencies.**
- The **SECOND** missed experiment will carry a grade of zero.
- The **THIRD** missed experiment will result in automatic failing grade, regardless of how the student performs otherwise. If you miss more than two experiments you should drop the course.

- No experiments can be made up, and no section switching is allowed.

Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

Student AccessAbility Services

The Office of Student AccessAbility is committed to ensuring that qualified students with documented disabilities are provided with an equal opportunity to participate in the variety of educational, recreational and social opportunities at UT Dallas. The Office of Student AccessAbility provides:

1. academic accommodations for students with a documented permanent physical, mental or sensory disability
2. non-academic accommodations
3. resource and referral information and advocacy support as necessary and appropriate.

Student AccessAbility

Student Services Building 3.200

Phone: 972-883-2098

Fax: 972-883-6561

disabilityservice@utdallas.edu

Office Hours

Monday-Thursday 8:30 am - 6 pm

Friday 8 am - 5 pm

Evenings by appointment

Mailing Address

UT Dallas Student AccessAbility

800 W. Campbell Rd., SSB32

Richardson, TX 75083

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Student AccessAbility Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

Off-Campus Instruction and Course Activities

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address given below. Additional information is available from the office of the school dean. (http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm)