

Chemistry 5326: Organic Spectroscopic Analysis

Fall 2015

3 Credits

Course Home Page: <http://harnedgroup.com/> → Classes link

Instructor: Andrew M. Harned, 223D Chemistry, (806) 834-6755, andrew.harned@ttu.edu

Lectures: M 5:00-7:50 PM, 234 Chemistry

Office Hours: times by appt

Required texts:

- 1) Simpson, J. H. *Organic Structure Determination Using 2-D NMR Spectroscopy*; 2nd edition, Academic Press: San Diego, CA, 2012.
- 2) Pretsch, E.; Bühlmann, P.; Badertscher, M. *Structure Determination of Organic Compounds*; 4th edition, Springer-Verlag: New York, 2009.

Grading 5326

Exam 1: 25%

Exam 2: 25%

Final exam: 25%

Project: 25%

Learning outcomes: This course is designed to teach you the tools you will need to identify the structure of virtually *any* structure. By necessity some time will be spent on the underlying principles of the techniques, however the vast majority of our time will involve discussing the characteristic spectral absorptions of the various functional groups and other tools needed to solve spectral problems. As such, class time will be devoted to solving spectral and structural problems. While you will not necessarily be introduced to new chemical reactions, some of the in class/exam questions will draw upon published and unpublished reactions for structural problems. Having some working knowledge of the structure and identity of a variety of functional groups, as well as general reactivity and bonding concepts is expected. Upon completion of this course, students will be able to interpret mass spectra, IR spectra, ¹H NMR, ¹³C NMR, and 2-D NMR spectra of organic molecules.

Problem Sets: Problem sets will be periodically given out and/or assigned from the required text. These problems will not be collected or graded. Working on these problems will be essential to understanding the course material. Working in groups on these problems is encouraged.

Exams: There will be two midterm exams and a take home final exam. Due to the nature of the course, all exams will be cumulative in nature. The first two exams will consist of a closed portion and an open book/note portion and are scheduled during the normal class time. The final exam will be completely open book/note. A strong knowledge of the material will allow you to finish the exam in time. In all cases, be sure to indicate what substructures you have identified and what pieces of information led you to that conclusion, as this will determine how much partial credit is given out.

Project: You will be given a series of spectra from a recently isolated compound. Working as a group of three, you will use these spectra to deduce the structure of this compound. The final report for this assignment will be submitted in *Organic Letters* format. There will be more details on a handout that will be given out later.

Important Dates:

Exam 1: October 5
Exam 2: November 2
Project Due: November 30
Final Exam Due: December 9, 11:30 AM

Policy on “I” Grade: A student may request an Incomplete grade only when (a) he or she has a University-sanctioned excuse for missing the final exam and (b) he or she is passing the course based on all other graded components. Assignment of an I requires that the instructor and student sign a contract stipulating the procedure by which the I grade will be made up (e.g., taking a final exam from another instructor in the next semester). Failure to successfully complete the procedure outlined in the contract will result in the I being administratively changed by the University Registrar to an F or N (depending on the grade base) one calendar year from the end of the semester for which the I grade was granted. You must meet with Dr. Harned to discuss an incomplete.

Religious Holy Day: A student who intends to observe a religious holy day should make that intention known to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination/quiz or complete an assignment scheduled for that day within a reasonable time after the absence.

Disability Statement: Texas Tech University is committed to providing equitable access to learning opportunities for all students. Student Disability Services (SDS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations. If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact SDS at 335 West Hall or 806-742-2405 to arrange a confidential discussion regarding equitable access and reasonable accommodations. Any student who because of a disability may require special arrangements in order to meet course requirements should contact Dr. Harned as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours or by email. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact the Student Disability Services office.

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating, and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce your ability to participate in daily activities. Texas Tech services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via www.depts.ttu.edu/scc/.

Scholastic Dishonesty: “Academic dishonesty” includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.” – *Texas Tech University Statement of Academic Integrity*. The *Code of Student Conduct* contains the definitions of Academic Integrity Code violations and can be accessed at: <http://www.depts.ttu.edu/dos/handbook/>

The attempt of students to present as their own any work not honestly performed is regarded as a most serious offense and renders the offenders liable to serious consequences, ranging from zero on a given assignment to a final grade of F and academic suspension.