Spectroscopy and Structural Elucidation
CHEM 395/425, Fall 2014

Dr. Daniel Becker, Ph.D.	Dr. Chad Eichman	Dr. David Crumrine
Flanner Hall 215	Flanner Hall 213	Flanner Hall 212
dbecke3@luc.edu	ceichman@luc.edu	dcrumri@luc.edu
http://www.luc.edu/chemistry/facultystaff/beckerdaniel.shtml	http://www.luc.edu/chemistry/facultystaff/eichmanchad.shtml	http://www.luc.edu/chemistry/facultystaff/crumrinedavid.shtml

Class Meets: Monday & Wednesday 4:00 – 5:15 PM Flanner 105

Office Hours

Dr. Becker	Friday 1:30-2:30 p.m.
Dr. Eichmann	Wednesday 10:30-11:30 a.m.
Dr. Crumrine	MWF 11:30 a.m. -12:30 p.m.

Required Text: Organic Structures from Spectra, 5th Edition (purple cover) by Field, Sternhell, and Kalman, Wiley, 2013. ISBN-13: 978-1118325490 ISBN-10: 1118325494.

Recommended: Organic Structural Spectroscopy, 2nd Edition by Lambert, Gronert, Shurvell and Lightner (2010, $$$), or Organic Structural Spectroscopy 1st Edition by Lambert (1998, Oldie but Goodie, 1998, ¢¢¢)

Other General References/Spectroscopy Texts:

- Organic Structure Analysis, 2nd Ed., by Crews, Rodriguez, and Jaspars, Oxford Press 2009
- Spectroscopic Id. of Organic Cmpds, 6th Ed., by Silverstein, Webster, & Kiemie, Wiley 2005
- Intro to Spectroscopy, 4th Ed., Saunders College, 2009, by Pavia, Lampman, Kriz, & Vyvyan
- Spectroscopic Methods in Organic Chemistry by Williams and Fleming, McGraw Hill, 1995

Prerequisite: Organic Chemistry CHEM 221/222 or CHEM 223/224

Course Outcome

This course will introduce the use of spectroscopy for the elucidation of organic structures. The methods will include IR spectroscopy, UV-Vis spectroscopy, Mass spectrometry, NMR techniques (1D and 2D), X-ray, and related computational techniques. The course will focus on the application of these methods in solving structures of organic molecules, with some instrument theory, some history, method development, and pertinent additional resources.

1. *Syllabus*: The current syllabus is available on Sakai and is subject to change (date at the top) during the semester. *You are responsible for all changes announced whether or not you are in attendance.*

2. *Exams and Grading:* Exams will be graded and returned to you as quickly as possible, usually by the following class period. All grading questions, points of clarification, and grading errors must be brought to the instructor's attentions during office hours no later than one week after return of the exam.

There will be three mid-term exams and one 2-hour final exam, plus homework assignments that will be collected and graded throughout the semester. Exams and assignments will be graded on a curve

based on the average and the standard deviation. In-class presentations/summaries may be substituted for mid-term exam III.

Mid-term exam I	20%	
Mid-term exam II	20%	
Mid-term exam III	20%	(or presentations)
Homework	20%	
Final Exam	20%	
TOTAL	100%	

You must bring a form of photo identification, such as your Loyola Student ID or your driver's license, with you to the exam, which you may be asked to show. All exams are closed book and closed notes, unless permission is explicitly given to allow certain resources. When you are finished with your exam, please bring your completed exam to the front, and leave the room quietly without disturbing the other students.

3. *Homework:* Various problem sets will be distributed throughout the semester. The material will be posted on Sakai and will be due at the specified date.

4. *Sakai Materials*: Handouts given in class are mirrored on Sakai so you can access materials and obtain extra copies if you wish.

5. *Academic Honesty:* All students in this course are expected to have read and to abide by the appropriate standard of personal honesty and integrity, drafted by the College of Arts & Sciences, that can be viewed online at:
http://www.luc.edu/cas/pdfs/CAS_Academic_Integrity_Statement_December_07.pdf

For this course, all exams are closed book and closed note unless specifically noted otherwise. Academic dishonesty includes using notes or books during exams, looking at another student's test during the exam period, or talking during an exam. The consequence of academic dishonesty is failure of the course, and the incident will be reported to the Chemistry Department Chair and the Office of the Dean. Additional sanctions including expulsion from the university may be imposed. The Undergraduate Handbook contains a complete description of the University policy regarding academic dishonesty. Anything you submit that is incorporated as part of your grade in this course (quiz, exam, lab report, etc.) must represent your own work. Any student caught cheating will, at the very minimum, receive a grade of "zero" for the item that was submitted. If cheating occurs during a course exam, the incident will be reported to the Chemistry Department Chair and the Office of the CAS Dean. Additional sanctions may be imposed.

8. The Tutoring Center offers free small group tutoring and lab (drop-in) tutoring for Loyola students. The groups meet once a week through the end of the semester and are led by a student who has successfully completed study in the course material. To learn more or request tutoring services, visit the Tutoring Center online at www.luc.edu/tutoring.

9. Please note that CAS has accommodations for students with disabilities (SSWD), including a testing center in the Sullivan Center. For more information see http://www.luc.edu/sswd/.

Chemistry 395/425 Tentative Schedule (subject to change)

Week	Professor	Monday	Wednesday
1	Dr. Becker	8/25 Introduction	8/27 1D NMR
2	"	9/1 Labor Day No class	9/3
3	"	9/8	9/10
4	"	9/15	9/17 Midterm 1
5	"	9/22	9/24
6	Dr. Eichman	9/29 2D NMR	10/1
7	"	10/6 Midsemester Break – no class	10/8
8	"	10/13	10/15
9	"	10/20 IR	10/22 Midterm 2
10	"	10/27	10/29
11	Dr. Crumrine	11/3 UV/Vis & MS	11/5
12	"	11/10	11/12
13	"	11/17	11/19
14	"	11/24 Midterm 3 *tentative*	11/26 Thanksgiving No class
15	"	12/1	12/3
16	---------	12/8 Cumulative Final Exam	12/10 ---------