

Spectroscopic Techniques in Organic Chemistry, CH 437 and CH 637

“fundamentals of spectroscopic determination of organic structure”

Fall 2006

Course description:

Theoretical and practical aspects of spectroscopic analysis of organic molecular structure, with an emphasis on NMR spectroscopy, including P-31.

Prerequisite: CH232, CH237/338, CH342, CH348.

Times: Tuesdays and Thursdays 8-9:15; exams Thursdays 19-21:00.

Location: 251 Shelby Hall (lectures and exams).

Instructor: O. Köhl (office: Shelby Hall L324B; T: 348-0455; Email: okuhl@bama.ua.edu).

Recommended textbook: Introduction to Spectroscopy, 3rd ed. Pavia, Lampman, Kirz.

COURSE SCHEDULE:

Introduction	VIII-24
Theory of NMR	VIII-29, 31
Proton-NMR	IX-5, 7, 12, 14, 19
Carbon-NMR	IX-21, 26, 28
Exam 1	IX-28
IR-Spectroscopy	X-3, 5
Phosphorus-NMR	X-10, 12, 17, 19, 24, 26
Dynamic-NMR, NOE, shift reagents	X-31, XI-2
Exam 2	XI-2
UV/Vis spectroscopy	XI-7, 9
Mass spectrometry	XI-14, 16
ESR-spectroscopy	XI-21, 28
Exam 3	XI-28 (Tuesday)
2D-NMR	XI-30, XII-5
Revision	XII-7
Final Exam	XII-14

CLASS FORMAT:

You should come prepared for lecture. That means you should have familiarised yourself with the materials given in the textbook or the handout (P-31).

Assignments are due one week from the time they are given and are ungraded. However, 75% need to be completed and handed in on time in order to pass the course. Three major exams covering the preceding section and a final exam covering the entire course will be given. IR spectroscopy will be part of exam 3. Graduate students have to hand in a graded literature assignment.

GRADE BREAKDOWN:

	CH437	CH637
Three exams (100 points each)	300	300
Final exam	200	200
Literature assignment	na	50
Total	500	550

HONOUR CODE:

The University honour code applies to this course. You will have to sign an honour pledge at the beginning of the course and on each exam.

ASSIGNMENTS:

Assignments – other than the literature assignment in CH637 – are intended as feedback. They give both of us an idea how well you are performing. You can use this information to address your weak points and I shall use it to assess where you have difficulties as a group.

Therefore, the more honest you are on these assignments the more you will get out of the course.

These assignments are not graded to make it easier for you to do them without any aid not available to you in an exam situation.

The literature assignment HAS TO be done without the aid of others. Apart from that you can use any resources available to a researcher at the University of Alabama.

DISABILITY ACCOMMODATION:

To request disability accommodations, please contact the office of disability services at 348-4285. After initial arrangements are made with that office, contact the instructor.

ADDITIONAL LITERATURE and RESOURCES:

- 1) Spectroscopic Identification of Organic Compounds, 7th edition by Robert M. Silverstein, Francis X. Webster and David J. Kiemle (Wiley; available at SER library).
- 2) Nuclear Magnetic Resonance Spectroscopy by John H. Nelson (Prentice Hall; heteronuclei).
- 3) Basic One- and Two-dimensional NMR Spectroscopy, 2nd edition by H. Friebolin (VCH).
- 4) NMR spectroscopy, 2nd edition by H. Günther (Wiley).

Web spectral problems with solutions: www.chem.ucla.edu/~webspectra/

Integrated spectral database for organic compounds: www.aist.go.jp/RIODB/SDBS/menu-e.html

Web structure elucidation workbook: www.nd.edu/~smithgrp/structure/workbook.html