

Chem 242C: Spectroscopy and Applied Analytical Methods
T/Th 9:50 – 11:25 am PSB 140
Spring Quarter 2018

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Course Overview: This is a 10-week course designed to introduce first year/second year grad students to the methods necessary for small molecule structure elucidation. This course is designed to provide both the theory and practical aspects of spectroscopy, to include UV, MS and NMR Spectroscopy, with a major emphasis on NMR. All students will be responsible for active involvement in the course. Much of the class will be done with real data and will require the use of a computer with the NMR processing software MestReNova. You can request a MestReNova license file from Jack Lee (jacklee@ucsc.edu).

Assignments and Exams: Points will be assigned in this course in three ways. Problem solving/homework (150), final exam (150) and solving an unknown (150).

Problem Solving: We will have problem solving sessions throughout the course. Each student will be responsible for leading at least a portion of one of the sessions.

Unknown: A goal of this course is to make everybody comfortable with hands on use of the Varian instruments, including tuning, shimming and acquiring complex experiments. Each student will be given 20 mg of an unknown compound for complete structural determination using NMR spectroscopy. More details will be provided a few weeks into the course.

Final: The final will be composed of theory and problem solving. It will be mix of an open note take home final (problem solving) and an in-class final on theory.

The following topics will be covered:

4/3	Intro – UV spectroscopy	5/22	Other Nuclei (^{19}F , ^{31}P), problem solving
4/5	Intro to NMR	5/24	Stereochemistry – Moshers, CD
4/10	Chemical shift and Coupling Constants	5/29	Stereochemistry – Moshers, CD
4/12	Interpretation of ^1H NMR	5/31	Problem Solving
4/17	^{13}C NMR, DEPT – problem solving	6/5	Problem Solving
4/19	2D NMR – COSY	6/7	Unknown presentation
4/24	2D NMR – HSQC, HMBC		
4/26	Problem solving		
5/1	Problem solving		
5/3	Additional 2D Experiments		
5/8	Through space interactions (NOE)		
5/10	Mass Spec I		
5/15	Problem solving		
5/17	Problem solving		

Textbooks:

No single text will be used, although the following reference books are recommended (not necessary to purchase, but try to find access to a copy when needed. My lab has multiple copies of Pretsch that can be used):

“Spectroscopic Identification of Organic Compounds”, Silverstein, R. 7th Edition, Silverstein

“Structure Determination of Organic Compounds: Tables of Spectral Data”, Pretsch, E

Note:

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, within the first two weeks of the quarter. At this time, I would also like us to discuss ways we can ensure your full participation in the course. UCSC encourages all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.