

# Spectroscopic Identification of Organic Compounds

Chemistry 572, Fall 2022

Brett VanVeller

**Office:** 3126 Hach Hall

**Lectures:** Tu, Th, 2:10 – 3:00 pm 1221 Hach

**Email:** bvv@iastate.edu

**Bootcamp:** Sat., 9:00 am – 12:00 pm 1st floor Hach

**Texts:** Not required: Silverstein, et al., *Spectrometric identification of organic compounds*. Any edition.

**Valuable resource:** NMR structure determination problems [nmr-challenge.com](http://nmr-challenge.com)

**Office hours:** By appointment

**Goals:** This course is designed to train you in the practical skill of interpretation of the spectra of organic molecules. You will be able to draw a molecular structure from nothing but spectra. Another important goal, however, is for you to understand how the measurements work so that you can be an intelligent and skilled user. A large fraction of the lecture time will be spent on problem solving strategies.

After this course, you will be able to have an in-depth discussion with a colleague or your PI about the spectroscopic data inherent to your project. You will be able to describe how and why a particular set of data should be obtained to support your research hypotheses. This may be the most directly applicable course you take in graduate school.

**Contact:** Please feel free to email me directly or through Canvas.

**Canvas:** Practice problems and previous exams will be posted on the Canvas website along with solutions.

**Saturdays:** **Structure determination boot camp.** The Saturday sessions are actually scheduled time for weekly problem-solving sessions that will begin September 19, 2020. These sessions are scheduled from 10 AM for 2 hours, but you may start as early as 9 AM if you feel you need the time. These sessions are open book, but you must bring your own materials. Sharing books or notes during these sessions is not allowed. Sessions 8–10 will be given as take-home and you are encouraged to collaborate and compare answers. Donuts are provided for the first session!

**Final exam:** No final exam, just the problem-solving sessions during the term.

**Grading:** The 10 problem-solving sessions during the term will be for credit. Each problem-solving “puzzle of fun” will be primarily NMR structure assignment and structure identification. The maximum number of points per session will vary, and your grade will be based on the maximum total points over the term. There is no formal grading scheme. Grade distributions float with the distribution of grades at the end of each term.

**Accessibility Statement:** Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be identified. After eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at [www.sas.dso.iastate.edu](http://www.sas.dso.iastate.edu), by contacting SAS staff by email at [accessibility@iastate.edu](mailto:accessibility@iastate.edu), or by calling 515-294-7220. Student Accessibility Services is a unit in the Dean of Students Office located at 1076 Student Services Building.

**Academic Dishonesty:** The class will follow Iowa State University’s policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the Dean of Students Office  
<http://www.dso.iastate.edu/ja/academic/misconduct.html>

**Dead Week:** This class follows the Iowa State University Dead Week policy as noted in section 10.6.4 of the Faculty Handbook <http://www.provost.iastate.edu/resources/faculty-handbook>.

***Tentative Lecture and Exam Schedule***

1. Week of 8/23	<b>Introduction and Review</b>	No Sat. class
2. Week of 8/30	<b>Nuclear Magnetic Resonance (NMR) Spectroscopy</b>	No Sat. class
3. Week of 9/6	<b>Nuclear Magnetic Resonance (NMR) Spectroscopy</b>	No Sat. class
4. Week of 9/13	<b>Nuclear Magnetic Resonance (NMR) Spectroscopy</b>	No Sat. class
5. Week of 9/20	<b>Nuclear Magnetic Resonance (NMR) Spectroscopy</b>	No Sat. class
6. Week of 9/27	<b>No classes</b>	Problem set 1 – 10/1
7. Week of 10/4	<b>Infrared Spectroscopy</b>	Problem set 2 – 10/8
8. Week of 10/11	<b>Infrared Spectroscopy</b>	Problem set 3 – 10/15
9. Week of 10/18	<b>2D Nuclear Magnetic Resonance (NMR) Spectroscopy</b>	Problem set 4 – 10/22
10. Week of 10/25	<b>2D Nuclear Magnetic Resonance (NMR) Spectroscopy</b>	Problem set 5 – 10/29
11. Week of 11/1	<b>2D Nuclear Magnetic Resonance (NMR) Spectroscopy</b>	Problem set 6 – 11/5
12. Week of 11/8	<b>Mass spectrometry</b>	Problem set 7 – 11/12
13. Week of 11/15	<b>Mass spectrometry</b>	PS 8+9 – due 11/19
14. Week of 11/22	<b>No Class - Thanksgiving Break</b>	PS 8+9 – due 11/29
15. Week of 12/29	<b>Other topics</b>	PS 10+11 – due 12/13
16. Week of 12/6	<b>Other topics</b>	PS 10+11 – due 12/13
17. Week of 12/13	<b>Finals Week</b>	No Final
<b>Good Luck!!!!</b>		

NOTE 1: Lecture material and organization may change during the semester. The dates for the Exams will not.

NOTE 2: Exams will be held in the 1st floor Hach Hall classrooms. We will spread out across all 3 classrooms.