

Practical Nuclear Magnetic Resonance Spectroscopy

1. Course information:

Course number: F419

1 credit Offered Spring semesters

Prerequisites: CHEM 321 or instructor permission

Location:

Lectures will be in REIC 165

Labs will be in REIC 136 for NMR time and REIC 132 will be available for some reactions and sample preparation.

Meeting time:

Lecture: Mondays: 11:45 am - 12:45 pm (On scheduled weeks)

Lab: Scheduled by the students as needed. Should average 1.5 hours per week, and not exceed 21 hours for the semester.

2. Instructor Information:

Dr. Carl Murphy, office: REIC 136; Phone: 474-5545;

e-mail: cjmurphy4@alaska.edu

Office Hours: Wednesdays: 11:45 am-12:45 pm or by appointment.

3. Textbook:

Required: Organic Structures from 2D NMR Spectra, L.D. Field, Wiley, 2015 first edition (\$47.61 on amazon).

4. Course description:

Students will be trained in the basic operation of multiple NMR instruments. The class will begin with a few lectures on theory and operation of the NMR instruments. Homework assignments will reinforce lecture material and provide practice in spectral interpretation. Students will spend much of the class time getting hands-on experience on the NMR. The second half of the class will be student-driven NMR-based research projects. At the end of the class, students will present their projects to the rest of the class.

5. Course Goals:

To provide students with a working background on Nuclear Magnetic Resonance, train them to be independent users of the NMR, and allow them to explore aspects of the NMR with a research project.

6. Student Learning Outcomes:

Students should leave this course with a basic understanding of NMR. They should also be able to safely operate the NMR instruments for standard NMR experiments in any future research in which they are involved.

7. Instructional Methods:

Lectures on the basics of NMR and its safe use will meet during the beginning of the semester. The laboratory meetings will focus on training students to operate the instruments. As students complete training they will be given user accounts on the NMR to start pursuing their own research project. The class will meet again at the end of the semester for students to present their research results.

8. Course calendar (tentative):

Week of	Lecture	Lab
1/18/2016	No Classes	NMR Tour and Check-in
1/25/2016	NMR Basics, Safety, and Review	Training on the 300
2/1/2016	Liquid Nitrogen Safety Meet in 136	Training on the 300
2/8/2016	Intermolecular Forces	Training on the 600
2/15/2016	Interpretation practice	Training on the 600
2/22/2016	Advanced Theory	Projects
2/29/2016	Unknown Practice	Projects
3/7/2016	Project Expectations	Projects
3/14/2016	Spring Break	
3/21/2016		Projects
3/28/2016		Projects
4/4/2016		Projects
4/11/2016		Projects
4/18/2016		Projects
4/25/2016	Final Exam	Projects
5/2/2016		Presentations 10:15 AM

9. Course policies:

Attendance at all lectures and scheduled lab times is expected and required. For the research projects, NMR usage will be scheduled based on need and availability of the instruments. When students sign up for an NMR time slot they are expected to use that time.

For the project, students are expected to schedule time to come in on their own to use the NMR for their projects. This time is expected to average 1.5 hours per week, but will be scheduled based on student and instrument availability. Total lab time for the semester should not exceed 21 hours.

10. Evaluation:

- 4 homework assignments (20 points each): 80 points total
- Final Project Presentation: 100 points
- Final exam: 80 points
- Participation: 40 points (based on attendance and involvement with class discussions)
- Total Points: 300

Grades will be letter grades without +/- modifiers following the cutoff values listed below.

- 90% -A
- 80% -B
- 70% -C
- 60% -D
- >60% -F

The final project will be graded as follows:

Criterion	Points
Lab Performance	20
Effective Application of NMR to your project	20
Project Plan (Due March 7)	20
Presentation	
Layout	10
Quality of Figures	15
Does it tell a story	15
Total	100

12. Disabilities Services:

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. Students with documented disabilities who may need reasonable academic accommodations should discuss these with the instructor during the first two weeks of class. The instructor will work with the Office of Disabilities Services (*208 WHIT, 474-5655) to provide reasonable accommodation to students with disabilities. You will need to provide documentation of your disability to Disability Services.