

1. Course information:

Title: Practical Nuclear Magnetic Resonance Spectroscopy

Course number: 494 trial course

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 137 will be available for some reactions and sample preparation.

Meeting time:

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

Lab: Fridays 2:15 pm - 5:15 pm (as needed)

2. Instructor Information:

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

E-mail: cjmurphy4@alaska.edu

Office Hours: Fridays 2:00 pm – 4:00 pm or by appointment.

3. Course readings/materials:

Handouts provided by the instructor.

Recommended: Organic Structure Determination using 2-D NMR Spectroscopy, Jeffrey Simpson, Academic Press (Elsevier), 2012 second edition (\$62.17 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:

Week	Lecture	Laboratory	Due
1	Syllabus, introduction to the instruments, Safety, review of spectra	NMR Tour and check-in	
2	Basic NMR Theory and practice analysis	Training on 300	Peak assignments
3	Advanced NMR experiments	Practice on 300	Peak assignments
4	Discuss Projects	Training on 600	determine structure
5	Discuss Projects	Practice on 600	project proposals, determine structure
6		Projects	
7		Projects	
8		Projects	
9		Projects	
10		Projects	
11		Projects	
12		Projects	
13	In-class Presentations		
14	In-class Presentations		

9. Course policies:

Attendance at all lectures 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.

10. Evaluation:

- 4 homework assignments (20 points each): 80 points total
- Final Project Presentation: 100 points

Criterion	Points
Lab Performance	20
Use of good lab etiquette	
Effective Application of NMR to your project	20
Presentation	
Organization	20
Quality of Figures	20
Does it tell a story	20
Total	100

- Final exam: 80 points
- Participation: 40 points

Based on attendance and involvement in class discussion

- 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

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.