

**FORMAT 1**

Submit original with signatures + 1 copy + electronic copy to Faculty Senate (Box 7500).  
See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

**TRIAL COURSE OR NEW COURSE PROPOSAL**
**SUBMITTED BY:**

Department	Chemistry	College/School	CNSM
Prepared by	Carl Murphy	Phone	4745545
Email Contact	cjmurphy4@alaska.edu	Faculty Contact	Carl Murphy

1. ACTION DESIRED (CHECK ONE): Trial Course ☐ New Course ☒

2. COURSE IDENTIFICATION: Dept CHEM Course # F419 No. of Credits 1

Justify upper/lower division status & number of credits:

This course requires CHEM 321 as a prerequisite, and includes extensive use of delicate instrumentation thus warranting upper division level students.

3. PROPOSED COURSE TITLE: Practical Nuclear Magnetic Resonance

4. To be CROSS LISTED? YES/NO NO If yes, Dept: Course #

NOTE: Cross-listing requires approval of both departments and deans involved. Add lines at end of form for additional required signatures.

5. To be STACKED? YES/NO NO If yes, Dept: Course #

How will the two course levels differ from each other? How will each be taught at the appropriate level?:

Stacked course applications are reviewed by the (Undergraduate) Curricular Review Committee and by the Graduate Academic and Advising Committee. Creating two different syllabi—undergraduate and graduate versions—will help emphasize the different qualities of what are supposed to be two different courses. The committees will determine: 1) whether the two versions are sufficiently different (i.e. is there undergraduate and graduate level content being offered); 2) are undergraduates being overtaxed?; 3) are graduate students being undertaxed? In this context, the committees are looking out for the interests of the students taking the course. Typically, if either committee has qualms, they both do. More info online – see URL at top of this page.

6. FREQUENCY OF OFFERING: Every Spring  
Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING (AY2013-14 if approved by 3/1/2013; otherwise AY2014-15) Spring 2015

**8. COURSE FORMAT:**

NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council. Furthermore, any core course compressed to less than six weeks must be approved by the Core Review Committee.

COURSE FORMAT: (check all that apply) ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 weeks to full semester

OTHER FORMAT (specify)

Mode of delivery (specify lecture, field trips, labs, etc) Lecture and Lab

9. CONTACT HOURS PER WEEK: .5 LECTURE hours/weeks 1.5 LAB hours/week PRACTICUM hours/week

Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 2400 minutes of lab in a science course=1 credit. 1600 minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for more information on number of credits.

OTHER HOURS (specify type)

RECEIVED

SEP 26 2014

Governance  
10/2/14 TLP

Dean's Office  
College of Natural Science & Mathematics



**10. COMPLETE CATALOG DESCRIPTION** including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

Example of a complete description:

**FISH F487 W, O Fisheries Management**

**3 Credits Offered Spring**

Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. *Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; or permission of instructor. Cross-listed with NRM F487. (3+0)*

**CHEM F419 Practical Nuclear Magnetic Resonance**

**1 Credit Offered Spring**

Students will be trained in the basic operation of NMR instruments. Students will spend much of the class time getting hands-on experience on the NMR with student-driven NMR-based research projects. At the end of the class students will present their projects to the rest of the class. *Prerequisite: CHEM F321. (.5 + 1.5)*

**11. COURSE CLASSIFICATIONS:** Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H classification appropriately; otherwise leave fields blank.

H = Humanities

S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core? If YES, attach form.

YES:

NO:

X

IF YES, check which core requirements it could be used to fulfill:

O = Oral Intensive, Format 6

W = Writing Intensive, Format 7

X = Baccalaureate Core

**11.A Is course content related to northern, arctic or circumpolar studies? If yes, a "snowflake" symbol will be added in the printed Catalog, and flagged in Banner.**

YES

NO

X

**12. COURSE REPEATABILITY:**

Is this course repeatable for credit?

YES

NO

X

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

How many times may the course be repeated for credit?

TIMES

If the course can be repeated for credit, what is the maximum number of credit hours that may be earned for this course?

CREDITS

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course?

CREDITS

**13. GRADING SYSTEM:** Specify only one. Note: Changing the grading system for a course later on constitutes a Major Course Change – Format 2 form.

LETTER:

X

PASS/FAIL:

**RESTRICTIONS ON ENROLLMENT (if any)**

**14. PREREQUISITES**

CHEM F321

These will be *required* before the student is allowed to enroll in the course.

**15. SPECIAL RESTRICTIONS, CONDITIONS**

**16. PROPOSED COURSE FEES**

\$120

Has a memo been submitted through your dean to the Provost for fee approval?

Yes/No

YES



**17. PREVIOUS HISTORY**

Has the course been offered as special topics or trial course previously?

Yes/No

YES

If yes, give semester, year, course #, etc.: Spring 2014, CHEM F494 (trial course)

**18. ESTIMATED IMPACT**

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

Budget – Some reagents will be needed, therefore the fee.

Facilities/Space – Need room for Lecture (preferably REIC 138) and may need some wet laboratory space (preferably in REIC 137)

Faculty – Should reduce the NMR workload for the instructor of Organic Chemistry.

**19. LIBRARY COLLECTIONS**

Have you contacted the library collection development officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No

X

Yes

Current library book selections seem adequate.

**20. IMPACTS ON PROGRAMS/DEPTS**

What programs/departments will be affected by this proposed action?

Include information on the Programs/Departments contacted (e.g., email, memo)

Impact to graduate and undergraduate research – Provides a route for new students/researchers to get training on NMR instruments and collect preliminary research data.

**21. POSITIVE AND NEGATIVE IMPACTS**Please specify **positive and negative** impacts on other courses, programs and departments resulting from the proposed action.

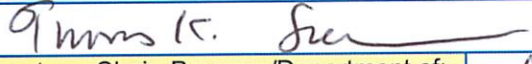
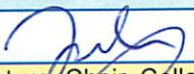

This course should enable students to be better prepared for CHEM F420, F314, F324, F488, F434 and other courses that have a project portion. More students being informed on the NMR technique should increase support for the NMR Facility and benefit more scientific research across campus.

**JUSTIFICATION FOR ACTION REQUESTED**

The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

This course provides training on the NMR instruments to students. The ability to use these valuable instruments will greatly benefit the student both while at UAF and in a future in industry or graduate school. The course is will fit easily with courses that have a research component (i.e. CHEM F314, CHEM F324, etc.), because NMR is such a versatile technique it can be beneficial to most research projects.

**APPROVALS: Add additional signature lines as needed.**

	Date	9-25-14
Signature, Chair, Program/Department of: Chem + Biochem		
	Date	9/27/14
Signature, Chair, College/School Curriculum Council for: CNSM		
	Date	10/2/14
Signature, Dean, College/School of: CNSM		

Offerings above the level of approved programs must be approved in advance by the Provost.

	Date	
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Signature of Provost (if above level of approved programs)

**ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE**

	Date	
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Signature, Chair

Faculty Senate Review Committee: \_\_\_Curriculum Review \_\_\_GAAC

\_\_\_Core Review \_\_\_SADAC

**ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking)**

	Date	
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Signature, Chair, Program/Department of:

	Date	
--	------	--

Signature, Chair, College/School Curriculum Council for:

	Date	
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Signature, Dean, College/School of:



**ATTACH COMPLETE SYLLABUS (as part of this application).** This list is online at:  
<http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/uaf-syllabus-requirements/>  
The Faculty Senate curriculum committees will review the syllabus to ensure that each of the items listed below are included. If items are missing or unclear, the proposed course (or changes to it) may be denied.

#### **SYLLABUS CHECKLIST FOR ALL UAF COURSES**

During the first week of class, instructors will distribute a course syllabus. Although modifications may be made throughout the semester, this document will contain the following information (as applicable to the discipline):

##### **1. Course information:**

☐ Title, ☐ number, ☐ credits, ☐ prerequisites, ☐ location, ☐ meeting time  
(make sure that contact hours are in line with credits).

##### **2. Instructor (and if applicable, Teaching Assistant) information:**

☐ Name, ☐ office location, ☐ office hours, ☐ telephone, ☐ email address.

##### **3. Course readings/materials:**

☐ Course textbook title, ☐ author, ☐ edition/publisher.  
☐ Supplementary readings (indicate whether ☐ required or ☐ recommended) and  
☐ any supplies required.

##### **4. Course description:**

☐ Content of the course and how it fits into the broader curriculum;  
☐ Expected proficiencies required to undertake the course, if applicable.  
☐ Inclusion of catalog description is *strongly* recommended, and  
☐ Description in syllabus must be consistent with catalog course description.

##### **5. ☐ Course Goals (general), and (see #6)**

##### **6. ☐ Student Learning Outcomes (more specific)**

##### **7. Instructional methods:**

☐ Describe the teaching techniques (eg: lecture, case study, small group discussion, private instruction, studio instruction, values clarification, games, journal writing, use of Blackboard, audio/video conferencing, etc.).

##### **8. Course calendar:**

☐ A schedule of class topics and assignments must be included. Be specific so that it is clear that the instructor has thought this through and will not be making it up on the fly (e.g. it is not adequate to say "lab". Instead, give each lab a title that describes its content). You may call the outline Tentative or Work in Progress to allow for modifications during the semester.

##### **9. Course policies:**

☐ Specify course rules, including your policies on attendance, tardiness, class participation, make-up exams, and plagiarism/academic integrity.

##### **10. Evaluation:**

☐ Specify how students will be evaluated, ☐ what factors will be included, ☐ their relative value, and ☐ how they will be tabulated into grades (on a curve, absolute scores, etc.) ☐ Publicize UAF regulations with regard to the grades of "C" and below as applicable to this course. (Not required in the syllabus, but is a convenient way to publicize this.) Link to PDF summary of grading policy for "C":

[http://www.uaf.edu/files/uafgov/Info-to-Publicize-C\\_Grading-Policy-UPDATED-May-2013.pdf](http://www.uaf.edu/files/uafgov/Info-to-Publicize-C_Grading-Policy-UPDATED-May-2013.pdf)

##### **11. Support Services:**

☐ Describe the student support services such as tutoring (local and/or regional) appropriate for the course.

**12. Disabilities Services:** Note that the phone# and location have been **updated**. <http://www.uaf.edu/disability/> The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials.

☐ State that you will work with the Office of Disabilities Services (208 WHITAKER BLDG, 474-5655) to provide reasonable accommodation to students with disabilities.

5/21/2013



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PO Box 756160  
Fairbanks, Alaska 99775-6160  
(907) 474-5510 Fax (907) 474-5640

26 Sept 2014  
cjmurphy4@alaska.edu

To: Susan Henrichs, Provost  
Pat Pitney, Vice Chancellor Administrative Services

Through: Paul Layer, CNSM Dean

Through: Thomas K. Green, Chemistry and Biochemistry Department Chair

From: Carl Murphy, Director of the UAF NMR Facility

Re: Lab fee for Chem 419 – Practical Nuclear Magnetic Resonance Spectroscopy

Detail Code: FCH1

This memo requests a \$120 laboratory fee for the students taking the new course proposed as Chem 419 Practical Nuclear Magnetic Resonance Spectroscopy during Spring 2015 and every spring semester thereafter. The course includes extensive use and training on the NMR instruments and includes a project using the NMR. All samples run on the NMR must be prepared in deuterated solvent, which cost approximately \$8 per sample. This fee should be able to both cover the expense of the solvents for the students and help support the required routine maintenance that keep the instruments functional for the students. This fee is consistent with the fee of other courses that include projects as a large portion of the coursework and should cover the expenses associated with teaching the class.

# Practical Nuclear Magnetic Resonance Spectroscopy

## 1. Course information:

Course number: 419

1 credit Offered Spring semesters

Prerequisites: CHEM 321 or instructor permission

Location:

Lectures will be in REIC 138

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 (For first 3 weeks to cover initial training)

Lab: Scheduled by the students as needed after the first three weeks. 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](mailto:cjmurphy4@alaska.edu)

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

## 3. Textbook:

**Required:** Organic Structure Determination using 2-D NMR Spectroscopy, Jeffrey Simpson, Academic Press (Elsevier), 2012 second edition (\$65.34 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	Monday	Tuesday	Wednesday	Thursday	Friday
1/20/2015	No Classes				NMR Tour and Check-in
1/27/2015	NMR Basics, Safety, and Review				Training on the 300
2/3/2015	Basic NMR Theory and analysis				Training on the 300
2/10/2015	Advanced NMR experiments				Training on the 600
2/17/2015	Discuss Projects				Training on the 600
2/24/2015	Discuss Projects				Projects
3/3/2015					Projects
3/10/2015					Projects
3/17/2015	Spring Break				
3/24/2015					Projects
3/31/2015					Projects
4/7/2015					Projects
4/14/2015					Projects
4/21/2015					Projects
4/28/2015	Final Exam				
5/5/2015					Research Presentations



## 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
Presentation	
Organization	20
Quality of Figures	20
Does it tell a story	20
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.