### TRIAL COURSE OR NEW COURSE PROPOSAL

#### SUBMITTED BY:
- **Department**: Chemistry
- **Prepared by**: Carl Murphy
- **Email Contact**: cjmurphy4@alaska.edu
- **College/School**: CNSM
- **Phone**: 474-5545
- **Faculty Contact**: Carl Murphy

#### 1. ACTION DESIRED
**(CHECK ONE):**
- Trial Course **X**
- New Course

#### 2. COURSE IDENTIFICATION:
- **Dept**: CHEM
- **Course #**: F494
- **No. of Credits**: 1

**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:
**Introduction to Nuclear Magnetic Resonance**

#### 4. To be CROSS LISTED?
**YES/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**
- If yes, Dept:  
- Course #

**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 2014**

#### 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 course compressed to less than six weeks must be approved by the Core Review Committee.

<table>
<thead>
<tr>
<th>COURSE FORMAT:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6 weeks to full semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>(check all that apply)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER FORMAT (specify)</th>
<th>Mode of delivery (specify lecture, field trips, labs, etc)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lecture and Lab</td>
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</table>

**RECEIVED**

**AUG 28 2013**

Dean’s Office

College of Natural Science & Mathematics
9. **CONTACT HOURS PER WEEK:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Type</th>
<th>Credits/Hours/Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>.5</td>
<td>Lecture</td>
<td>1.5 Lab</td>
</tr>
</tbody>
</table>

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/faculty-senate/curriculum/course-degree-procedures/guidelines-for-computing](http://www.uaf.edu/faculty-senate/curriculum/course-degree-procedures/guidelines-for-computing) for more information on number of credits.

OTHER HOURS (specify type)

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 F494** Introduction to 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: Completion of CHEM F321; or permission of instructor. (0.5 + 1.5)

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

<table>
<thead>
<tr>
<th>H = Humanities</th>
<th>S = Social Sciences</th>
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</thead>
</table>

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

YES: [ ] NO: [ ]

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

<table>
<thead>
<tr>
<th>O = Oral Intensive, <strong>Format 6</strong></th>
<th>W = Writing Intensive, <strong>Format 7</strong></th>
<th>X = Baccalaureate Core</th>
</tr>
</thead>
</table>

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 [ ]

12. **COURSE REPEATABILITY:**

<table>
<thead>
<tr>
<th>Is this course repeatable for credit?</th>
<th>YES [ ] NO [ ] X [ ]</th>
</tr>
</thead>
</table>

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?

<table>
<thead>
<tr>
<th>TIMES</th>
<th>CREDITS</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>CREDITS</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>CREDITS</th>
</tr>
</thead>
</table>

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

NO

If yes, give semester, year, course #, etc.:

18. ESTIMATED IMPACT

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

Budget – Unknown
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 CHEM F324W laboratory.

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, F413, F324, F488, 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 easily fit with courses that have a research component (i.e. CHEM F413W, CHEM F324W, etc.), because NMR is such a versatile technique it can be beneficial to most research projects.
**APPROVALS:** Add additional signature lines as needed.

<table>
<thead>
<tr>
<th>Signature, Chair, Program/Department of:</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Chen</td>
<td>28 Aug 2013</td>
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</table>

<table>
<thead>
<tr>
<th>Signature, Chair, College/School Curriculum Council for:</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Thomas K. Green</td>
<td>9-23-13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature, Dean, College/School of:</th>
<th>Date</th>
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<tbody>
<tr>
<td></td>
<td>9-24-2013</td>
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</table>

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

<table>
<thead>
<tr>
<th>Signature of Provost (if above level of approved programs)</th>
<th>Date</th>
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</table>

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

<table>
<thead>
<tr>
<th>Signature, Chair</th>
<th>Date</th>
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<tbody>
<tr>
<td>Faculty Senate Review Committee:</td>
<td>Date</td>
</tr>
<tr>
<td>Curriculum Review</td>
<td>GAAC</td>
</tr>
<tr>
<td>Core Review</td>
<td>SADAC</td>
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</tbody>
</table>

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

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<thead>
<tr>
<th>Signature, Dean, College/School of:</th>
<th>Date</th>
</tr>
</thead>
</table>
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”:

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
1. Course information:

   Title: Practical Nuclear Magnetic Resonance Spectroscopy
   Course number: CHEM 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,

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:

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Laboratory</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Syllabus, introduction to the instruments, Safety, review of spectra</td>
<td>NMR Tour and check-in</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Basic NMR Theory and practice analysis</td>
<td>Training on 300</td>
<td>Peak assignments</td>
</tr>
<tr>
<td>3</td>
<td>Advanced NMR experiments</td>
<td>Practice on 300</td>
<td>Peak assignments</td>
</tr>
<tr>
<td>4</td>
<td>Discuss Projects</td>
<td>Training on 600</td>
<td>determine structure</td>
</tr>
<tr>
<td>5</td>
<td>Discuss Projects</td>
<td>Practice on 600</td>
<td>project proposals, determine structure</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Projects</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Projects</td>
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<td>13</td>
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<td>In-class Presentations</td>
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<tr>
<td>14</td>
<td></td>
<td>In-class Presentations</td>
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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
• Final exam: 80 points
• Participation: 40 points
• 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.