

Chem 488 Undergraduate Research  
2009-2010

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**Catalog description.** “Advanced research topics from outside the usual undergraduate laboratory offerings. The student will be required to make a presentation and turn in a final report. Research areas range from atmospheric chemistry to molecular biology. *A substantial level of chemistry or biochemistry background is assumed*”.

(This usually means the student should at least have taken some lab course(s) past the 100-level, although ultimately it is up to the individual professor whether a student is sufficiently qualified to do a research project in his or her lab. Research projects for freshmen and sophomores can also be done as Special Project 197/297/397 etc. )

**Students! Before you begin working in a research lab you must obtain a Lab Safety Card from Emily Reiter. Then, and only then, may you begin lab work.**

**To do:**

1. Visit three profs and discuss their possible projects
2. Choose one project with the approval of the professor.
3. Write up a half-page description of the project and a description of potential hazards.
4. Get signatures from your new research mentor, and Emily Reiter
5. Make copies for yourself, and hand in the two pages in JKs mailbox, room 194
6. Pick up a lab book from 194, and start to work!

**General.** Involvement in research can be an important ingredient in a successful and satisfying undergraduate program in chemistry or biochemistry. This course was established to give undergraduates a chance to participate in ongoing research projects in departmental laboratories, to discuss possible projects with department faculty, carry out the research, write a research report, and present a poster.

**Number of credits.** Credits are assigned at the beginning of the semester when students enroll, but may be subject to change as the result of consultation between the student and professor. One credit of 488 is reserved generally for library or small computational projects. In general, 2 credits provides an absolute minimum amount of time to accomplish a laboratory project; the usual lab-based project will require about 3 credits per semester; 4 credits may be appropriate if the student has a large ongoing project with plenty of available time. More than 4 credits per semester generally will not be approved. Each credit of 488 corresponds to an average weekly minimum of 3 hours working productively in the lab, plus one to two hours planning, interpretation, notebook writing, and reading outside of lab.

**Finding a project.** New 488 students, or ones working with a different professor, must meet with at least three department faculty (see last page) to discuss possible projects, and select a research mentor. The signatures of the three faculty members must be obtained on the attached form. Also, write up a half-page statement outlining the proposed research project, including one reference, and a description of possible hazards associated with the project. This should be submitted by 5 PM of the 3<sup>rd</sup> Friday of the semester as a hard copy in JK’s mailbox, or by email to [ffjwk@uaf.edu](mailto:ffjwk@uaf.edu). Please also send a copy to your mentor. This statement should be written in consultation with your research mentor. For more information about faculty and their research areas, visit the faculty web pages at <http://www.uaf.edu/chem/faculty.htm>

**Continuing students.** *Each semester* 488 students must hand in a half-page statement outlining that semester’s proposed research. If the procedures or materials of your ongoing project

are different this semester than last, also note that at the bottom of the page, and get the signatures of your research professor and Emily Reiter. We need continuous documentation that you and your research professor are aware of the potential hazards of carrying out this research project in his or her lab.

**Required semester report.** *Each semester* a final written report in journal format is required. The report should follow the format of a manuscript to be submitted to a research journal. Early in the semester discuss the appropriate journal format with your mentor. Midway through the semester is not too early to begin writing the report using data obtained to date, describing the research background, and methods. Copies of the report are to be handed in to both your mentor and JK no later than 5 PM on the last day of final exams for that semester.

**Poster.** *Each semester*, research students must present a poster at the end-of-the-semester departmental potluck/poster session. If you are a continuing student, a poster describing your most recent results is required. The usual size is 36" x 36", which will be printed with departmental funds. A larger size may be appropriate if the student will be presenting a poster at a regional or national conference.

**Grades.** Your grade in the course is assigned by the instructor (JK) in consultation with your research mentor. The grade is based on the amount and quality of the research done, and the quality of the report and poster. Discuss grading with your research mentor early in the semester to find out how he or she defines satisfactory progress on, or completion of, a research project.

**Attendance.** Establish a regular schedule of attendance in the lab in consultation with your mentor. You may also be asked to attend a regular research discussion with your mentor, and/or group meetings, which are informal research or literature discussion sessions held every so often during the semester. Regular attendance in the research lab, and at research meetings or group meetings, is *required*.

**Notebook.** Research-style notebooks must be obtained from the Department of Chemistry and Biochemistry. Do not purchase your own. Keep complete notes of data, procedures, and results using neat handwriting. The lab notebook may be taken home for report writing, but must ultimately remain in the lab or be turned in to the research mentor.

**New-Digital data.** Collections of other forms of data such as NMR spectra should contain cross-references to pages in the notebook. The digital data itself (IR spectra files, NMR spectra files, Gaussian log and checkpoint files, HyperChem .hin files, Excel spreadsheets, the report in .doc format, etc) should be burned on a CD, labeled, and handed in at the end of each semester.

**Safety.** All research students must obtain a Lab Safety Card from Emily Reiter, the department's Laboratory Safety Coordinator. Contact Emily in 194A Reichardt or [fnear@uaf.edu](mailto:fnear@uaf.edu) or 474-6748. See Emily to arrange for training *before* beginning your project. Emily may require that you give her a brief written statement describing your project, especially emphasizing the safety and environmental aspects of the project.

**Safety tips.** While Emily will provide a thorough review of safety issues, and you will hopefully have gained safety knowledge in previous lab courses, here we emphasize several important points. Lab work must be carried out with all due caution. Do not work alone. Wear safety glasses at all times in the lab, even if you are not actually performing an experiment (someone else may be doing so!). Do not eat or drink in the lab. Do not rush. Do not attempt a procedure without the necessary training. Familiarize yourself with the potential hazards of materials you are using. Use common sense. This is a learning experience, so do not be bashful about asking for assistance.

**End of semester Lab Inspection Checklist.** At the end of each semester, all students must complete Lab Inspection Checklist with the research mentor or Emily Reiter. The checklist will emphasize checking that all chemicals are properly stored, glassware has been washed and put away, and the lab space is generally neat.

University of Alaska Fairbanks  
Department of Chemistry & Biochemistry

Undergraduate Research, Chemistry 488

Student Name \_\_\_\_\_  
UAF email address \_\_\_\_\_@alaska.edu

Return this page with three or more signatures to JK's mailbox in Reichardt 194 no later than the 3<sup>rd</sup> Friday of the semester. Include a half-page description of the proposed research project.

|                     |       |             |
|---------------------|-------|-------------|
| Cathy Cahill .....  | _____ | Date: _____ |
| Thomas Clausen .    | _____ | Date: _____ |
| Kelly Drew .....    | _____ | Date: _____ |
| Lawrence Duffy ..   | _____ | Date: _____ |
| Thomas Green ....   | _____ | Date: _____ |
| William Howard ..   | _____ | Date: _____ |
| John Keller .....   | _____ | Date: _____ |
| Thomas Kuhn .....   | _____ | Date: _____ |
| Brian Rasley .....  | _____ | Date: _____ |
| Marvin Schulte .... | _____ | Date: _____ |
| William Simpson ..  | _____ | Date: _____ |
| Thomas Trainor ..   | _____ | Date: _____ |

I have agreed to serve as research mentor for the above student. A brief description of the proposed research, along with a statement of possible laboratory hazards associated with the project, is attached.

\_\_\_\_\_ Date: \_\_\_\_\_  
Mentor Signature

\_\_\_\_\_ Number of Credit hours \_\_\_\_\_  
Mentor Print name

The above student has received his or her Lab Safety Card and is approved for working on this project

\_\_\_\_\_ Date \_\_\_\_\_  
Emily Reiter

Write neatly on this, or  
type up your own.

University of Alaska Fairbanks  
Department of Chemistry & Biochemistry  
Undergraduate Research, Chemistry 488

Name \_\_\_\_\_ Semester \_\_\_\_\_  
Mentor \_\_\_\_\_

Description of proposed research:

Lead-in literature reference:

Overview of planned laboratory procedures and materials, including descriptions of potentially hazardous procedures or materials.