



Chemistry and Biochemistry Research, CHEM 488

2-3 Credits

Spring 2021

General Information

<i>Instructor:</i>	Dr. Tom Green	<i>Office Location:</i>	Reichardt 174
<i>Email:</i>	tkgreen@alaska.edu	<i>Office Hours:</i>	TBA, by Zoom.
<i>Telephone:</i>	(907) 452-6370 home (907) 744-2726 cell	<i>Course Type:</i>	Laboratory,
<i>Course Location:</i>	Zoom Weekly Updates Laboratory Research in Mentor's Lab	<i>Meeting Time:</i>	TBA

Prerequisites

Prerequisites: CHEM F434 or CHEM F314.

Course 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*”

Course Readings/Materials

Lab notebook for recording experimental data, results and conclusions. The lab notebook will be supplied by the department or the student may purchase their own labnote book. Student Lab Notebook, 2012 Book Factory, Lab-050-7GSS, 50 pages.

Technology requirements

A University of **Alaska email address** is required for all communication in the class. This also provides access to the Blackboard system for individual scores and grades.

Students must have regular **access to a computer and the Internet to access online materials in Blackboard**. Students will be expected to download course material as well as upload assignments. Email is also for this class since enrollment is low.



Chemistry and Biochemistry Research, CHEM 488

2-3 Credits

Spring 2021

Course Goals

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.

Student Learning Outcomes

Students learn how current chemistry and biochemistry studies are conducted through direct research experience. In addition to conducting the research, students present their research and write a comprehensive report of the quality expected of by ACS for a graduating chemistry or biochemistry major.

American Chemical Society Definition of Undergraduate Research: The ACS Committee on Professional Training (CPT) approves our programs and defines undergraduate research in their guidelines (<http://www.uaf.edu/files/chem/CPT-BS-Guidelines2008.pdf>) as:

The research project should be envisioned as a component of a publication in a peer-reviewed journal. It should be well-defined, stand a reasonable chance of completion in the available time, apply and develop an understanding of in-depth concepts, use a variety of instrumentation, promote awareness of advanced safety practices, and be grounded in the primary chemical literature.

Research can satisfy up to four semester credit hours or six quarter credit hours of the in-depth course requirement for student certification and can account for up to 180 of the required 400 laboratory hours. A student using research to meet the ACS certification requirements must prepare a well-written, comprehensive, and well-documented research report including safety considerations. Although oral presentations, poster presentations, and journal article co-authorship are valuable, they do not substitute for the student writing a comprehensive report.

Instructional Methods

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. In general, two (2) credits provide an absolute minimum amount of time to accomplish a laboratory project; the usual lab-based project will require about 3 credits per semester. More than 3 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.



Chemistry and Biochemistry Research, CHEM 488

2-3 Credits

Spring 2021

Finding a project. After meeting with a faculty mentor about the research, write up a half-page statement outlining the proposed research project, including one reference, and a description of possible hazards associated with the project. You need to get signatures of your research mentor and Emily Reiter, Safety Officer. This should be submitted by September 15 of the semester by email a PDF file to tkgreen@alaska.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>

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.

Summary reports. You will need to write up 2 periodic progress summaries (background literature research, things you have tried, whether successful or not) during the course of the semester. **These reports should be no longer than 1 page, double-spaced.** The amount of research you present must be judged by the professor (Green) to be appropriate for the number of credits you are signed up for (*e.g.* we expect more for somebody taking the course for three credits than from somebody taking two credits). Each report will be graded promptly as "acceptable" or "insufficient", with acceptable being 10 points, and insufficient as 0 points.

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 submitted to your mentor and the instructor (Green) no later than **11:59 pm on April 28, 2021.**

Required Research Poster. *Each semester*, research students must present a poster at the end-of-the-semester departmental potluck/poster session. For summer students, your poster will be presented in April of 2021. 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. **A tentative date for the Poster Session is April 22, 3:30 pm, during our normal Departmental Potluck time. However, the poster session is more likely to be by Zoom at this time.**

Grades. Your grade in the course is assigned by the instructor (Green) 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. The components of the grade are described in the table below.

Grade component	Points
Progress Presentations (20 pts each, 2 required) Due Fridays, Feb 19, Mar 19; 11:59 pm	40
Poster Session: Thursday Apr 22, 3:30 pm	100
Semester Research Paper, Apr 28, 11:59 pm.	100
Total	240

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 should be used. 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 complete laboratory safety training. Contact Emily Reiter, the department's Laboratory Safety Coordinator in 194A Reichardt or e.reiter@alaska.edu or 474-6748, to arrange for training *before* beginning your project. Emily will require that you give her a brief written statement describing your project, especially emphasizing the safety and environmental aspects of the project.



Chemistry and Biochemistry Research, CHEM 488

2-3 Credits

Spring 2021

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.

Explanation of Student Effort

Students are expected to spend on average **3 hours in the laboratory per credit hour** to be successful. Thus, you should expect to spend 8-12 hours outside of class on study for this class.

Course Schedule

There will be weekly zoom sessions with students at 11:45 am -12:45 pm on Wednesdays.

Laboratory work will be conducted at a time and place in accordance with your research mentor.

Course Policies

Expectations on Progress in Coursework.

Students are expected to find a research mentor by Sept 15, 2020, complete safety training, and begin research activities. Summary reports are due, and a final research paper and poster presentation are required.

Plagiarism and Academic Integrity

Academic dishonesty applies to examinations, assignments, and laboratory reports. Examples include, but are not limited to:

- Presenting as their own the ideas or works of others without proper citation of sources;
- Utilizing devices not authorized by the faculty member;
- Using sources (including but not limited to text, images, computer code, and audio/video files) not authorized by the faculty member;
- Providing assistance without the faculty member's permission to another student, or receiving assistance not authorized by the faculty member from anyone (with or without their knowledge);
- Submitting work done for academic credit in previous classes, without the knowledge and advance permission of the current faculty member;



Chemistry and Biochemistry Research, CHEM 488

2-3 Credits

Spring 2021

- Acting as a substitute or utilizing a substitute;
- Deceiving faculty members or other representatives of the university to affect a grade or to gain admission to a program or course;
- fabricating or misrepresenting data;
- Possessing, buying, selling, obtaining, or using a copy of any material intended to be used as an instrument of assessment in advance of its administration;
- Altering grade records of their own or another student's work;
- Offering a monetary payment or other remuneration in exchange for a grade; or
- Violating the ethical guidelines or professional standards of a given program.

For more, see [Students Rights and Responsibilities](#).

Extended Absence Policy

Extended absences are defined as missed classes or course work by students beyond what is permissible by the instructor's written course policies. Students may need to miss class and/or course work for a variety of reasons, including, but not limited to:

- Official UAF activities such participation in athletic events, conferences, etc.
- Bereavement
- Personal illness or injury
- Serious illness of a friend, family member or loved one
- Military obligations
- Jury service
- Other emergency or obligatory situations

For more information, go to the student handbook or the Center for Students Rights and Responsibilities.

UAF Incomplete Grade Policy:

Your instructor follows the University of Alaska Fairbanks Incomplete Grade Policy:

"The letter "I" (Incomplete) is a temporary grade used to indicate that the student has satisfactorily completed (C- or better) the majority of work in a course but for personal reasons beyond the student's control, such as sickness, has not been able to complete the course during the regular semester. Negligence or indifference are not acceptable reasons for an "I" grade."

For more information, see [the UAF regulations regarding grades](#).

Student Protections Statement

I will work with the Office of Disability Services to provide reasonable accommodation to students with disabilities. The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures



Chemistry and Biochemistry Research, CHEM 488

2-3 Credits

Spring 2021

that UAF students have equal access to the campus and course materials. I will work with the Office of Disabilities Services (208 Whitaker, 907-474-5655) to provide reasonable accommodation to students with disabilities uaf.edu/disability/

UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX).

Faculty members are designated as responsible employees, which means they are required to report sexual misconduct. Graduate teaching assistants do not share the same reporting obligations. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site: <https://www.uaf.edu/handbook/>

Title IX

University of Alaska Board of Regents have clearly stated in BOR Policy that discrimination, harassment and violence will not be tolerated on any campus of the University of Alaska. If you believe you are experiencing discrimination or any form of harassment including sexual harassment/misconduct/assault, you are encouraged to report that behavior. If you report to a faculty member or any university employee, they must notify the UAF Title IX Coordinator about the basic facts of the incident.

Your choices for reporting include:

- 1) You may access confidential counseling by contacting the UAF Health & Counseling Center at 907-474-7043;
- 2) You may access support and file a Title IX report by contacting the UAF Title IX Coordinator at 907-474-6600;
- 3) You may file a criminal complaint by contacting the University Police Department at 907-474-7721.
<https://uaf.edu/oeo/civil-rights/aa-eo/>

Any UAF employee or volunteer who reasonably suspects or observes minor abuse or maltreatment is required to report the incident. Reporting procedures are available on the UAF Protection of Minors. Violation of this policy by employees shall be reported as well.

Equal Opportunity Employer

UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: alaska.edu/nondiscrimination.



Chemistry and Biochemistry Research, CHEM 488

2-3 Credits

Spring 2021

Library

Contact the Elmer E. Rasmuson Library at UAF reference desk for help with research. library.uaf.edu or 907-474-7481

Student Support Services

The Student Support Services (SSS) program, located in 514 Gruening Building, provides opportunities for academic development, assists students with college requirements, and serves to motivate students towards successful completion of their degree program.

Students have access to services if they meet any of the three eligibility requirements: a) limited income, b) documented disability, or c) first generation college student. Students receive intensive advising, one-one-one tutoring, technology check-outs, free printing and copying, computer lab space, and many other services. Additional information is at <https://www.uaf.edu/ssc>, or contact them directly at (907) 474-6844.

Rural Student Services

Responding to student needs by providing quality services to Native and rural students who expend positive effort in the pursuit of higher education and its opportunities. Please see: <https://uaf.edu/ruralss/>. Additional student support services can be found here: <https://www.uaf.edu/ruralss/tutoring-services/>.

UAF Help Desk

Go to <https://alaska.edu/oit/> to see about current network outages and news. Reach the Help Desk at: helpdesk@alaska.edu or 907-450-8300 (in the Fairbanks area) or 1-800-478-8226 (outside of Fairbanks).

eCampus Student Services

UAF eCampus Student Services helps online students with registration and course schedules, provides information about lessons and student records, assists with the examination process, and answers general questions. Their Academic Advisor can help students communicate with instructors, locate helpful resources, and maximize their learning experience. Contact the UAF eCampus Student Services staff at 907-479-3444 (toll free 1-800-277-8060) or contact staff directly – for directory listing see: <https://ecampus.uaf.edu/contact>

Effective Communication Resources

- UAF Speaking Center (907-474-5470, speak@uaf.edu, Gruening 507)
- Writing Center (907-474-5314, uaf-writingcenter@alaska.edu, Gruening 8th floor)
- UAF Math Services, uafmathstatlab@gmail.com, Chapman 305 (for math fee paying students only)
- Debbie Moses Learning Center at CTC (907-455-2860, 604 Barnette St, Room 120).



Chemistry and Biochemistry Research, CHEM 488

2-3 Credits

Spring 2021

- Developmental Math Lab, Gruening Building, Rm 406

For more information and resources, please see the academic advising resource list:

https://www.uaf.edu/advising/lr/SKM_364e19011717281.pdf

Veteran and Military Support Services

UAF is committed to all veterans and military students—active duty, reserve, guard, separated and retired—as well as their dependents who are exploring UAF's academic opportunities. Staff members in Financial Aid, Admissions, Career Services, Veterans' Services and the Veterans' Resource Center are here to help you with any challenges you encounter while working while in or transitioning from a military to an academic environment. Please contact the Veterans Resources Center, 907-474-2475, <https://uaf.edu/veterans/> in room 111 in the Eielson Building.

Emergency Notification Plan

Students will receive emergency notifications via phone or email. Please check your uaonline account to confirm your emergency notification settings. for more information, please refer to the student handbook. in cases where you do not have access to your devices, as your instructor, I will take responsibility to relay any emergency notifications.

COVID-19

Students should keep up-to-date on the university's policies, practices, and mandates related to COVID-19 by regularly checking this website:

<https://sites.google.com/alaska.edu/coronavirus/uaf/uaf-students?authuser=0>

Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply.

Student protections statement

UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX). Faculty members are designated as responsible employees which means they are required to report sexual misconduct. Graduate teaching assistants do not share the same reporting obligations. For more information on your rights

as a student and the resources available to you to resolve problems, please go to the following site:

<https://catalog.uaf.edu/academicsregulations/students-rights-responsibilities/>.