

Submit originals (including syllabus) and one copy and electronic copy to the Faculty Senate Office
 See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL
 Attach a syllabus, except if dropping a course.

SUBMITTED BY:

Department	Chemistry & Biochemistry	College/School	CNSM
Prepared by	Tom Green	Phone	474-1559
Email Contact	tkgreen@alaska.edu	Faculty Contact	Tom Green

1. COURSE IDENTIFICATION: As the course now exists.

Dept Course # No. of Credits

COURSE TITLE

2. ACTION DESIRED: Check the changes to be made to the existing course.

Change Course If Change, indicate below what is changing. Drop Course

NUMBER	<input type="text"/>	TITLE	<input checked="" type="checkbox"/>	DESCRIPTION	<input checked="" type="checkbox"/>
PREREQUISITES*	<input checked="" type="checkbox"/>	FREQUENCY OF OFFERING			<input checked="" type="checkbox"/>

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

CREDITS (including credit distribution)	<input type="text" value="1-2"/>	COURSE CLASSIFICATION	<input type="text"/>
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ADD A STACKED LEVEL (400/600) Dept. Course #

Include syllabi.

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.

ADD NEW CROSS-LISTING	<input type="text"/>	Dept. & No.	Requires approval of both departments and deans involved. Add lines at end of form for additional signatures.
STOP EXISTING CROSS-LISTING	<input type="text"/>	Dept. & No.	Requires notification of other department(s) and mutual agreement. Attach copy of email or memo.
OTHER (specify)	<input style="width: 100%;" type="text"/>		

3. 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 and the appropriate Faculty Senate curriculum committee. 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 all that apply)

Mode of delivery
 (specify lecture, field trips, labs, etc.)

4. **COURSE CLASSIFICATIONS:** (undergraduate courses only. Use approved criteria found in Chapter 12 of the curriculum manual. If justification is needed, attach separate sheet.)

H = Humanities S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core? YES NO

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

O = Oral Intensive, *Format 6 also submitted W = Writing Intensive, *Format 7 submitted X = Baccalaureate Core

- 4.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

5. **COURSE REPEATABILITY:**

Is this course repeatable for credit? YES NO

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

This course is a research course and progression of skills is learned as it is repeated.

How many times may the course be repeated for credit? 2 TIMES

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course? 2 CREDITS

6. **COMPLETE CATALOG DESCRIPTION** including dept., number, title, credits, credit distribution, cross-listings and/or stacking, clearly showing the changes you want made. (Underline new wording strike through old wording and use complete catalog format including dept., number, title, credits and cross-listed and stacked.)

Example of a complete description:

PS F450 Comparative ~~Aberiginal~~ Indigenous Rights and Policies (s)

3 Credits

Offered As Demand Warrants

~~Case study~~ Comparative approach in ~~assessing~~ analyzing ~~Aberiginal~~ Indigenous rights and policies in different nation-state systems. ~~Seven~~ Multiple ~~Aberiginal situations~~ countries and specific policy developments examined for factors promoting or limiting self-determination. Prerequisites: Upper division standing or permission of instructor. (Cross-listed with ANS F450.) (3+0)

CHEM F288 Introduction to Chemical and Biochemical Research

1-2 Credits

Offered Spring

Scientific research is creative and engaging when properly planned and executed. This course introduces students to the process of planning and executing a research project. We will begin with an idea, review primary literature, brainstorm project ideas, pose a testable hypothesis, plan experiments and execute a small research project.

~~Co-Prerequisites:~~ Co-Prerequisites: CHEM F212, or CHEM F321; or permission of instructor.

Lecture + Lab + Other: ~~1~~0 + 3-~~6~~ + 0

7. **COMPLETE CATALOG DESCRIPTION AS IT SHOULD APPEAR AFTER ALL CHANGES ARE MADE:**

CHEM F288 Introduction to Chemical and Biochemical Research

1-2 Credits

Scientific research is creative and engaging when properly planned and executed. This course introduces students to the process of planning and executing a research project. We will begin with an idea, review primary literature, brainstorm project ideas, pose a testable hypothesis, plan experiments and execute a small research project.

Co-requisites: CHEM F212 or CHEM F321; or permission of instructor.

Lecture + Lab + Other: 0 + 3-6 + 0

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8. **GRADING SYSTEM:** Specify only one.

LETTER: PASS/FAIL:

9. **ESTIMATED IMPACT**

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

This course is already offered. We are making a change in title, co-requisites, frequency of offering, and the option of 1 or 2 credits. There will be no affect on budget.

10. **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 Yes

Current library collection is adequate for the course. This course will rely heavily on electronic subscriptions to primary literature.

11. **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)

The Department of Chemistry and Biochemistry is the only affected program. This course has been successful in preparing mid-career students for the required CHEM 488 (Chemical Research).

12. **POSITIVE AND NEGATIVE IMPACTS**

Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.

Positive: This course provides the opportunity for mid-level students to participate in chemical and biochemical research earlier in their academic career. We will allow them to take either 1 or 2 credits and it will be offered each semester. There is maximum of 2 credits for the student. This change allows for incorporation in the Chemistry major with Biochemistry concentration.

13. **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. If you ask for a change in # of credits, explain why; are you increasing the amount of material covered in the class? If you drop a prerequisite, is it because the material is covered elsewhere? If course is changing to stacked (400/600), explain higher level of effort and performance required on part of students earning graduate credit. Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the course is not compromised as a result.

Chem 288 is a course designed to introduce students to research experience. We request several changes.

- (1) The name Biochemical needs to be incorporated since we are requiring this course now for the Biochemistry option.
- (2) In the Biochemistry option, we want students to take this their second year. They will not have taken Chem 212 Chemical Equilibrium Analysis or Chem 321 Organic Chemistry I at this time. We prefer that one of these course is a co-requisite, rather than making them both pre-requisite. Students do not need this material in order to begin to understand the research process.
- (3) We prefer that students be allowed to take 2 credits over a 2-semester sequence to allow continuity in the research endeavor. Thus students will have the option of taking either 1 or 2 credits in a given semester. This provides for more flexibility for the Biochemistry concentration.
- (4) If the student takes only 1 credit, they are allowed to repeat one more time for a total of 2 credits.

APPROVALS: (Forms with missing signatures will be returned. Additional signature blocks may be added as necessary.)

Thomas K. Free Date *10-7-16*

Signature, Chair, Program/Department of: *Chemistry & Biochemistry*

DocuSigned by: *Patricia Doak* Date October 21, 2016

Signature, Chair, College/School Curriculum Council for: CNSM

DocuSigned by: *Lawrence Lopez* Date October 21, 2016

Signature, Dean, College/School of: CNSM

Offerings above the level of approved programs must be approved in advance by the Provost (e.g., non-graduate level program offering of a 600-level course):

Signature of Provost (if applicable) Date

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

Signature, Chair Date

Faculty Senate Review Committee: Curriculum Review GAAC
 Core Review SADAC

ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking; add more blocks as necessary.)

Signature, Chair, Program/Department of: Date

Signature, Chair, College/School Curriculum Council for: Date

Signature, Dean, College/School of: Date

Note: If removing a cross-listing, you may attach copy of email or memo to indicate mutual agreement of this action by the affected department(s).

If degree programs are affected, a Format 5 program change form must also be submitted.

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

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.

CHEM 288: Introduction to Chemical Research

Course Name: CHEM 288: Introduction to Chemical Research, 1-2 credits
Co-requisites: CHEM 212 or CHEM 321 or instructor permission
Lab: TBA

Instructor: Tom Green
Office: Reichardt 174
Phone: 907-474-1559
Email: tkgreen@alaska.edu
Office Hours: TBD, By appointment

Catalogue Course Description: Scientific research is creative and engaging when properly planned and executed. This course introduces students to the process of planning and executing a research project. We will begin with an idea, review primary literature, brainstorm project ideas, pose a testable hypothesis, plan experiments, and execute a small research project.
Co-requisites: CHEM 212 or CHEM 321

Expanded Course Description: In this course, mid-level chemistry majors are paired with graduate student mentors (enrolled in CHEM 686: Chemical Research Mentoring) based on research interests and be introduced to the process of planning a research project. Students in this course will begin with an idea, then review primary literature to survey ongoing research in that field, brainstorm project ideas, pose a testable hypothesis, then plan an experiment and execute a small research project. The emphasis of this course is to increase research readiness for students entering URSA 388 and CHEM 488 by focusing on the research planning skills, although students will also have supervised hands-on lab experience. Join us to experience first hand how creative and engaging scientific research can be!

Instructional Methods: Undergraduate students will be paired with faculty as well as graduate student mentors enrolled in CHEM 686 Research Mentoring to develop and execute a research project. The emphasis of this course is on planning a research project through mentoring interactions with graduate students and faculty.

Course Goals: Students will learn and practice the process of developing an idea into a testable hypothesis and planning a research project to address their hypothesis. At the conclusion of this course, students will present their research plan and the results of preliminary investigations at the Department Poster Session as well as have a research proposal to potentially submit for funding to continue their project.

Student Learning Outcomes: Students will be prepared to plan and execute their future research projects. Upon successful completion of this course, students will:

- Complete all required safety trainings to work in labs in the UAF chemistry department.
- Propose an area of research, perform a literature review, and pose a testable hypothesis.
- Develop a realistic, statistically valid research plan.
- Execute preliminary experiments to provide preliminary data or proof of concept.
- Identify appropriate funding sources and write a proposal.

CHEM 288: Introduction to Chemical Research

Example Student Projects: Student project topics will vary based on the expertise of graduate students enrolled in CHEM 686 and vary each semester.

- Investigation of toxic metals present in mine tailings as a function of particle size, which affects transportability, solubility, and bioaccessibility. This would involve drying soils, size separation using sieves and settling rate in water. Each size fraction could then be analyzed for elemental composition using bulk X-ray Fluorescence by preparing a pressed pellet.
- Investigation of chemical moieties present in size fractionated aerosol particulate samples by acid digestion and subsequent analysis by Inductively Coupled Plasma- Mass Spectrometry. Determining the size fractions metals are associated with is a critical component of determining the distance traveled by particulate matter.

Course Evaluation:

There are **500 total points available** in this class. Grades are assigned as follows: 500-450 A, 450-400 B, 400-350 C, etc.

Assignment	Points
Proposal format, proposal topic	30
Lab rotation summaries	20
Project Ideas	50
Literature Review	75
Project Plan and revisions	75
Research proposal	100
Final presentation	50
Final research proposal	50
Mentor and instructor evaluations	50
Total	500

Safety training- Students will perform all safety trainings required by the Department of Chemistry. This will be done through an in-person training January 26 2:15-5:15 pm in REIC 245.

Lab rotation summaries- Undergraduate students will participate in shadowing opportunities with graduate students. The students will then write a summary of their experiences.

Students will progressively work toward developing a research proposal. Assignments will include:

Research topic: 1-2 paragraph summary of the direction students are interested in pursuing.

Project idea: 1-2 page summary of literature related to the research topic proposed (incorporating faculty and mentor feedback), clearly state a student-generated testable hypothesis, and briefly outline proposed experiments. These will require students to articulate their plans and serve to nucleate student-mentor-faculty discussions aimed toward helping student to refine their ideas.

Literature review: 2-3 page summary of pertinent literature with appropriately formatted citations. This should be written to both report breadth of research in the area as well as the findings of a few of the most relevant studies. The last paragraph will clearly identify the need for the project idea previously proposed and refined through feedback from faculty and CHEM 686 mentors.

Project plan: The student will propose a specific plan for preliminary experiments as well as larger-scale potential follow-on experiments with a clear link to the testable hypothesis proposed. Required components: purpose, step-by-step instructions for performing preliminary lab experiments, safety plan, plan for statistical analysis of data, expected outcomes and how the results will be related back to the hypothesis, and potential large-scale follow-on experiments.

CHEM 288: Introduction to Chemical Research

Research Proposal: Students will generate and revise an original research proposal with preliminary data that can be submitted for funding to continue the research project. The format and length of the proposal depends on where the proposal will be submitted.

Final presentation: Students will present a 10-minute presentation of their research proposal and the preliminary results during the final exam period.

Mentor and instructor evaluation: Students will have periodic feedback on their progress in their research progress with their mentor and instructor.

Course Policies: Continued attendance to class indicates each student agrees to the policies set forth in this syllabus.

Collaboration, Classroom Behavior and Late work- Collaboration and working in small groups is a key component of classroom and lab time. Your mentor is there to support your learning, not do the work for you. Students are expected to conduct themselves in a professional manner at all times. Disrespect of the classroom learning environment, instructors or mentors, and fellow students will not be tolerated!

Late work is accepted at a 20% per day reduction of the points possible. This is in an effort to keep the entire class moving through the projects efficiently.

Instructor-Initiated Withdrawals- Any time up to and including Friday, March 13, the instructor has the right to withdraw a student that "...has not participated substantially in the course." In CHEM 288 nonparticipation includes: poor attendance or lack of participation in lecture or lab (has missed more than 3 class sessions), or fails to turn in any assignment within a week of the due date.

Honor code and Academic integrity- Students are expected to conduct themselves in accordance with the UAF Honor code. The Chemistry Department policy states: *Any student caught cheating will be assigned a course grade of F. The students' academic advisor will be notified of this failing grade and the student will not be allowed to drop the course.*

Disability Services- I will work with the Office of Disabilities Services (208 Whitaker Bldg, 474-5655) to provide reasonable accommodation to students with disabilities. It is the student's responsibility to make an appointment with me to discuss appropriate accommodations within the first two weeks of the first class meeting. A letter from disabilities services must be provided for discussion at that time.

Veteran Support Services- Walter Crary (wecrary@alaska.edu) is the Veterans Service Officer at the Veterans Resource Center (111 Eielson Building, 474-2475). Fairbanks Vet Center 456-4238. VA Community Based Outpatient Clinic at Ft. Wainwright is 361-6370.