

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
(Attach copy of syllabus)

SUBMITTED BY:

Department	Chemistry & Biochemistry	College/School	CNSM
Prepared by	Tom Green	Phone	474-2766
Email Contact	tkgreen@alaska.edu	Faculty Contact	Kriya Dunlap

1. ACTION DESIRED (CHECK ONE):	Trial Course	<input checked="" type="checkbox"/>	New Course	<input type="checkbox"/>
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2. COURSE IDENTIFICATION:	Dept	Chem	Course #	494	No. of Credits	3
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Justify upper/lower division status & number of credits: **This is an advanced course that builds on lower level chemistry and biochemistry courses**

3. PROPOSED COURSE TITLE:	Nutritional Biochemistry
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4. To be CROSSED LISTED? YES/NO	No	If yes, Dept:		Course #	
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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?*	No	If yes, Dept:		Course #	
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How will the two course levels differ from each other? How will each be taught at the appropriate level?:

* Use only one Form at 1 form for the stacked course (not one for each level of the course!) and attach syllabi. 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:	Spring semesters
Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Dem and Warrants	

7. SEMESTER & YEAR OF FIRST OFFERING (Effective AY2015-16 if approved by 3/31/2015; otherwise AY2016-17)	Spring 2015 as trial course (offered previously as Special Topics Chem 493 in Spring 2014)
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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)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input checked="" type="checkbox"/> 6 weeks to full semester
OTHER FORMAT (specify)						
Mode of delivery (specify lecture, field trips, labs, etc)	Lecture + lab (2+3)					

RECEIVED

SEP 19 2014

Dean's Office
College of Natural Science & Mathematics

Governance
9/25/14 TLP

9. CONTACT HOURS PER WEEK:

2

LECTURE
hours/weeks

3

LAB
hours /weekPRACTICUM
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-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 F487W, 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 Nutritional Biochemistry

3 credits Offered Spring

This course integrates introductory concepts from chemistry and biochemistry in structuring research projects, using the resources and expertise available at UAF, to address nutritional inquiries relevant to Alaska or Native Health. Topics discussed will include components in Alaskan foods, such as phytonutrients and omega 3 fatty acids as well as any health disparities that are affected by these compounds such as diabetes, cardiovascular disease and metabolic syndrome. The course is designed for the application of practical biochemical knowledge towards current nutritional issues, and at the same time acquiring and demonstrating biochemical skills. *Prerequisite: CHEM F321*

11. **COURSE CLASSIFICATIONS:** Undergraduate courses only. Consult with CIA 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, Form at 6

W = Writing Intensive, Form at 7

X = Baccalaureate Core

11.A Is course content related to northern, arctic or circum polar studies? If yes, add in the printed Catalog, and flagged in Banner.

"snowflake" symbol will be

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 - Form at 2 form.

LETTER:

x

PASS/FAIL:

RESTRICTIONS ON ENROLLMENT (if any)

14. PREREQUISITES

Chem 321 Organic Chemistry I

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

15. SPECIAL RESTRICTIONS, CONDITIONS

16. PROPOSED COURSE FEES

\$65.00

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

Yes/No

X
(previously
as special
topics)

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.:

Special Topics, Chem 493 Nutritional Biochemistry, Spring 2014

18. ESTIMATED IMPACT

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

This class is expected to have a low initial enrollment and is being developed in hopes to become a new writing-intensive course for Chemistry. In such, in the future, the class will likely be capped at a low enrollment. The instructor (Kriya Dunlap) has sufficient space in her lab to accommodate the students for the laboratory portion of this course. Once a class time has been selected, WRRB 009 will be requested for classroom space. I have used this space in the past for Chem 674 and it is a state-of-the-art classroom, equipped with many technological advances that will serve this course well. In addition it is in the same building as the laboratory space.

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

No Required textbook. Selected readings only.

20. IMPACTS ON PROGRAMS/DEPTS

What program(s)/department(s) will be affected by this proposed action?

Include information on the program(s)/department(s) contacted (e.g., email, memo)

None, other than offer our Chemistry & Biochemistry students a nutritional biochemistry course relevant to many student's interest. Space is available in Dunlap's lab (see above).

21. POSITIVE AND NEGATIVE IMPACTS

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


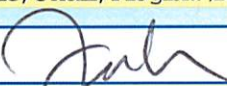
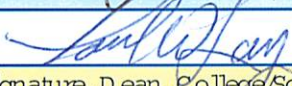
No negative impacts. Course complements other existing Biochemistry courses (Chem F450 and F451).

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.

Besides providing a course on a current and engaging topic related to nutritional biochemistry, this course integrates concepts learned in previous courses into a "real world" learning experience. It supports UAF's strategic plan and its diversity goals by integrating traditional knowledge in the science educational experience. The goal is to create an increased sensitivity to different types of knowledge while learning the fundamentals of nutritional biochemistry. The eventual plan for this course, should it be successful, is for it to satisfy the writing intensive "W" criteria and possible become a capstone course. This is a trial run.

APPROVALS: Add additional signature lines as needed.

	Date	9-18-14
Signature, Chair, Program / Department of: <u>Chemistry & Biochemistry</u>		
	Date	9-24-14
Signature, Chair, College/School Curriculum Council for: <u>CNSM</u>		
	Date	9/24/14
Signature, Dean, College/School of: <u>CNSM</u>		

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

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

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

	Date	
Signature, Chair		
Faculty Senate Review Committee: <input type="checkbox"/> Curriculum Review <input type="checkbox"/> GAAC		
<input type="checkbox"/> Core Review <input type="checkbox"/> SADAC		

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

	Date	
Signature, Chair, Program / Department of:		
	Date	
Signature, Chair, College/School Curriculum Council for:		
	Date	
Signature, Dean, College/School of:		

Nutritional Biochemistry: Indigenous Health**Chem 494****3 credits**

Instructor: Kriya Dunlap, 474-2766, kldunlap@alaska.edu

Office Hours: Department of Chemistry and Biochemistry
West Ridge Research Building (WRRB), 230
3 hours TBA

Lecture: TBA (2 hours lecture + 2 hours laboratory)

Text (optional): Martha H. Stipanuk
Biochemical and Physiological Aspects of Human Nutrition, 3rd Edition
Saunders Publishing
ISBN: 1437709591
Published 2012
Supplementary readings: Library, web, manuscripts etc.

Course:

This 3-credit course focuses on integrating introductory concepts from chemistry and biochemistry in structuring research projects addressing nutritional concerns relevant to Alaska or Native health. Topics discussed will include components in Alaska foods, such as phytonutrients and omega-3 fatty acids and the health disparities that are affected by these compounds, such as diabetes, cardiovascular disease, inflammation and metabolic syndrome. We will tackle these issues by studying their biochemical foundation and acquiring an understanding of study design, through the development of testable hypotheses, data interpretation and research presentation. Proposal writing, research compliance, research techniques, and experimental design and execution will be central topics. Each topic will be addressed with a group project, in which the students design, manage, execute and decipher results of their project. The course is designed for the application of practical biochemical knowledge towards a current nutritional issue, while simultaneously establishing biochemical skills and resource sharing.

Proficiencies: Some knowledge of general, organic and biochemistry.

Course Goals:

- Understanding the biochemical basis of nutrition through indigenous health and Alaska resources.
- Allow students to integrate concepts learned in general, organic and biochemistry into a nutritional context.
- Use basic concepts to formulate hypotheses, select pertinent literature, interpret experimental data and propose meaningful experimental approaches to solving current questions in nutritional biochemistry.
- Experience the development of research projects from proposal writing to data presentation.
- Be exposed to ethical and compliance issues required for modern day funded research.

Learning Outcomes:

1. Identify molecular components in Alaska's food supply and their role in disease prevention.
2. Correlate chemical and physical properties of nutrients with their cellular functions.
3. Write a testable hypothesis for each project as a group.
4. Keep a detailed laboratory notebook/record, statistically analyze data, and present findings at the chemistry and biochemistry department end-of-year poster session.
5. Select key concepts from the text and arrange information in a relevant way for group dissemination and for use as a study guide. Use mixed technology or teaching aids. Group interaction will be encouraged.
6. Discuss current IACUC/IRB and address compliance issues pertaining to their projects.

Instructional Methods:

The course will begin with instructor-led lectures aimed at establishing the biochemical foundations needed to design and execute Alaska relevant nutritional research projects. Once the foundations are established, class time will be spent on developing a research project pertaining to that unit. Group discussion will offer a platform for brainstorming, troubleshooting, and collaborative research, while establishing successful laboratory practices. Students will have the opportunity to review supporting literature, relevant to the selected aim and therefore learn how to do a literature search. Student will be expected to share key findings from their literature search with the class in an effort to develop a strong hypothesis, review literature, write a protocol and perform and interpret their experiments. While, there will be an in-depth text book available as a reference (see above), reading material will include special interest pieces, examples of proposals, IACUC/IRBs and relevant manuscripts. Blackboard will be used as a central communication platform for announcements, posting of lectures and reading material, and distribution/collection of exams. For resource sharing, dropbox, googledocs or a blackboard classroom blog will be established.

Evaluation:

Students will be evaluated in four key areas – hypothesis development, project proposal, laboratory practices, final research report, and poster presentation.

Hypothesis development	10%
Literature review:	30%
Relevance	
Approach	
Presentation to the class	
Laboratory practices, preparation, notebook keeping	10%
Research Report	20%
Participation	10%
Poster	20%

Grading: Totals will be translated into a letter grade. Total point percentages of 90, 80, 70 and 60 correspond to the lower cutoff boundaries for the grades of A, B, C and D respectively. Percentages less than 60 constitute a failing grade ("F").

Course Policies:*Attendance and participation:*

Regular student attendance is expected to ensure consistent discussion and project progress.

Active student participation is expected and is subject to a grade.

Hypothesis development:

Hypothesis development will be worked into each lecture and time will be allocated within the topic discussion for group development. The instructor will provide guidelines and limitations so that students can shape a realistic and testable hypothesis surrounding Alaska foods, Indigenous Health or current nutritional issues.

Project Proposal:

Before students begin their projects, each student will perform a literature review and share it with the class. The students will work together to write a proposal for each project by delegating sections for each person or pair to contribute; person(s) responsible for each section will rotate. The proposal will follow NIH guidelines and more specifically will follow the guidelines established by INBRE for undergraduate and graduate proposals. Instructor approval and input will be required before experimentation begins. A great deal of the class will be dedicated to writing proposals with testable hypotheses with a practical approach that can be completed within the limited time frame.

Laboratory Practices:

Laboratory practices encompass supply ordering, note-keeping, experiment organization and general laboratory etiquette. Students are expected to keep an up-to-date and detailed laboratory notebook that will be reviewed regularly by the instructor. Students are expected to find best-fit products for the research, taking into account cost, specificity and ease of use, and then fill out a purchase requisition for each item needed. Students will be expected to set up or organize experiments ahead of time (labeling tubes, making reagents etc.) as to minimize waste and expense. General laboratory etiquette is expected and will be subject to grading. This includes, washing dishes, putting away materials, emptying waste, restocking reagents and wearing appropriate protective clothing. Appropriate safety training and research compliance will be addressed.

Research Report:

A short report is due at the completion of each project. This will include an introduction, materials and methods, results with statistics, and conclusion. This will be done as a group and each person or pair will be responsible for each section, alternating from week to week.

Poster:

The final project is a poster presentation at the Department of Chemistry and Biochemistry end-of-year poster session. Students will be graded on over-all aesthetics, layout, organization, figures and generally how easy it is to read and find information. Students will also be graded on their ability to answer questions and engage with their audience.

Ethical Considerations:

Any student caught cheating will be assigned a course grade of "F". The student's academic advisor will be notified of this failing grade and the student will not be allowed to drop the course.

Student Code of Conduct:

As a UAF student, you are subject to the Student Code of Conduct. The university assumes that the integrity of each student and of the student body as a whole will be upheld. Honesty is a primary responsibility of you and every other UAF student. It is your responsibility to help maintain the integrity of the student community. More detailed information about UAF's Student Code of Conduct can be found at <http://www.uaf.edu/catalog/current/academics/regs3.html>; it goes as follows:

- 1) Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and examinations.
- 2) Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses and other reports.
- 3) No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors. Violations of the Honor Code will result in a failing grade for the assignment and, ordinarily, for the course in which the violation occurred. Moreover, violation of the Honor Code may result in suspension or expulsion.

Support Services:

Support services will be provided by the University of Alaska Library system, online resources and the instructor. Additional services are available through Student Support Services (<http://www.uaf.edu/sssp/>) at UAF.

Disabilities Services:

We will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide accommodations for students with disabilities. If you have a disability and require special assistance, please contact the instructor as soon as possible. Students with disabilities must provide a written statement indicating any special requirements that will be necessary as early in the semester as possible (preferably within the first week).

Tentative Class Schedule

Week beginning on:	Lecture Activity/Topic	Laboratory	Assignment
01/15/14	-Syllabus/Course outline - hypotheses development, proposal writing, and experimental design	-laboratory safety and compliance - Distribute lab notebooks and discuss record keeping/ lab etiquette	-Discovery News: Inuit Paradox -INBRE student proposals
01/19/14	-Indigenous Health: Diabetes, Obesity, metabolic syndrome, CVD -Alaska Foods: polyphenolic compounds (carotenoids, anthocyanins, proanthocyanins) and omega-3 fatty acids	-The principles of ELISA and bioassays. -how to order materials	-Read protocols for microscopy (how to tag with primary and secondary), ELISAs (GLUT4), and assay kits (nSMase).
01/26/14	-Quantitative Research: measurable parameters (cytokines, stress hormones, insulin pathway intermediates, antioxidant status, ORAC, fluorescent tags etc.)	- write hypothesis for Assay or ELISA study -start growing 3T3-L1 cells	-literature review (3 papers or 1 review article)
02/02/14	-Present summary of literature review -Discuss experimental protocols	-outline experiment -layout experiment (label tubes, prep samples etc.) -crude aqueous extracts of plants	-write section of proposal
02/09/14	-review statistics (simple t-test, standard deviations, probability, significance)	-run experiment	-write section of report
02/16/14	Discuss research model systems available: Cell culture, microscopy, archived dog plasma, sled dogs races in march. -discuss articles	-start differentiating 3T3-L1 cells, layout semester long schedule for the maintenance and differentiation. -JOVE	-manuscripts on AK berries in neuroinflammation and diabetes. -manuscript on metabolic syndrome, subsistence foods and cardiovascular disease in AK natives.
02/23/14	-Qualitative Research: Interviews, Focus groups, analyzing published research, and how to interpret data.	-Formulate interview topic	-read for discussion, selected documents on Qualitative design.

	-come up with qualitative index in current literature, i.e. smoking and diabetes.	-select interview questions from student homework and organize in class (in laboratory) focus group.	-write interview questions
03/02/14	-Create a focus group topic for in class focus groups. -interpret results. How do you interpret the results of focus groups?	-lead and participate in class-run focus groups	-review 3 articles pertaining to qualitative index and compile results into a quantitative measure.
03/09/14	-present results from qualitative index, compile all data from the class for a report. -Discuss diet questionnaires, physical activity questionnaires, consent forms, CANHR questionnaires.	-Administer questionnaires to fellow students.	-write section of a report for qualitative index. -do a 24 hour food recall to hand in after spring break.
03/16/14	SPRING BREAK		
03/23/14	-Address laboratory and research compliance: When is an IACUC or IRB necessary? What laboratory training is required for the methodology proposed? Where do you go to get this training?	-visit IACUC/IRB office or do online training. -in-class IRB/IACUC preparation for real or mock project.	-read human GLUT4 IRB -read sled dog IACUC -Prepare section of IRB/IACUC
03/30/14	-Write hypothesis for Qualitative research -present literature review	-write interview or focus group questions or quantitative parameters in lab. -perform experiment	-literature review (3 papers or 1 review article)
04/06/14	-Write hypothesis for Quantitative biochemical experiment. -Discuss experimental design (purpose of duplicates, how to standardize etc.)	-fluorescently label cells and visualize under microscope. How do you quantify?	-write section of report for on-campus qualitative study -literature review (3 papers or 1 review article)
04/13/14	-data analysis -What is the significance of results of research?	-Run experiment	-write section of proposal

Dunlap

Spring 2015

04/20/14	-lecture on food contamination and bioaccumulation. -demonstration on augmented reality using mercury and bioaccumulation poster	-How to structure and make a scientific poster -Augmented reality laboratory/do your own.	-write report for quantitative project
04/27/14	-Present methods from one of our studies with a JOVE type report.	-complete posters	-complete posters
05/14	-Poster presentation at Department poster session		