FORMAT 1

Submit original with signatures + 1 copy + electronic copy to UAF Governance.

See http://www.uaf.edu/uafgov/faculty/cd for a complete description of the rules governing curriculum & course changes.

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

Department	GPMSL	**College/School**	SFOS
Prepared by	Ana M. Aguilar-Islas	**Phone**	907 474 1524
Email Contact	amaguilarislas@alaska.edu clneumann@alaska.edu	**Faculty Contact**	Ana M. Aguilar-Islas

1. ACTION DESIRED (CHECK ONE): Trial Course [X] New Course [ ]

2. COURSE IDENTIFICATION: Dept MSL | Course # 694 | No. of Credits 3

Justify upper/lower division status & number of credits: This upper division/graduate level course is intended for students with a background in marine science and chemical oceanography. There will be 3 hours of lecture per week. Homework assignments, a term paper, and/or a presentation will be required.

3. PROPOSED COURSE TITLE: Chemical Coastal Processes

4. To be CROSS LISTED? YES/NO No | If yes, Dept: | Course #

(Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)

5. To be STACKED? YES/NO Yes | If yes, Dept. MSL | Course # 494

6. FREQUENCY OF OFFERING: Alternate Spring

Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING (if approved) Spring 2011

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) [ ] *1* [ ] *2* [ ] *3* [ ] *4* [ ] *5* [X] *6 weeks to full semester*

OTHER FORMAT (specify) _____

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

9. CONTACT HOURS PER WEEK: [3] LECTURE hours/weeks | [ ] LAB hours /week | [ ] PRACTICUM 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/cd/credits.html for more information on number of credits.

OTHER HOURS (specify type)

10. COMPLETE CATALOG DESCRIPTION including dept., number, title and credits (50 words or less, if possible):

MSL 694 Chemical Coastal Processes
3 credits Offered Spring
A study of chemical processes in the coastal ocean. This course will examine chemical interactions at different boundaries, and explore physical and biological controls on the chemistry of coastal environments. Topics include: Photochemical processes; the role of suspended particles; coastal acidification; controls on coastal productivity; future challenges in coastal management.

11. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)

H = Humanities [ ] S = Social Sciences [ ]

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

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

O = Oral Intensive, Format 6 [ ] W = Writing Intensive, Format 7 [ ] Natural Science, Format 8 [ ]

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 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.

LETTER: [X] PASS/FAIL: [ ]

RESTRICTIONS ON ENROLLMENT (if any)

14. PREREQUISITES General chemistry or graduate standing (600 level) or permission of instructor (400 level)

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

RECOMMENDED Chemical Oceanography

Classes, etc. that student is strongly encouraged to complete prior to this course.

15. SPECIAL RESTRICTIONS, CONDITIONS None

16. PROPOSED COURSE FEES $0

Has a memo been submitted through your dean to the Provost & VCAS for fee approval? Yes/No [ ]

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.

No impact on budget, facilities/space. The instructor, a recently hired SFOS faculty, is developing this course to help fulfill her teaching workload (2-3 courses per academic year).

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 [ ] Yes [X]

Communication with Anne Christie (Biosciences Library) determined the reading material required for the course is available from the library collection. An updated list of readings will be provided to Anne to ensure all reading material is available to students during the class period

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)

The proposed new course will have a positive impact on the MSL program by increasing the available courses offered to graduate students. A course in chemical coastal processes will be of interest to Fisheries students (graduate and undergraduate) as well as to graduate students in Environmental Chemistry.

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 are expected from this course. The MSL program will be impacted positively by offering a course that focuses on the coastal ocean, as the course will promote a better understanding of chemical interactions in coastal

waters, and will be useful for students whose research takes place in coastal environments.

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.

The coastal ocean is particularly vulnerable to environmental change. Understanding interactions among physical, chemical, and biological processes is necessary to predict and address the effects of ongoing environmental changes. Recent developments, including coastal acidification, eutrophication, and hypoxia in productive coastal regions highlight the need for understanding the chemical interactions involved. Currently the MSL program only offers one graduate course (MSL F626) that focuses on coastal/shelf processes, and it does so from a physical standpoint. Two chemistry-focused courses offered (MSL 660 and MSL 270) address the global ocean, touching only briefly on chemical coastal processes. The proposed course will provide students with a detailed study of chemical processes in the coastal ocean, adding depth and complementing information from the existing courses.

APPROVALS:

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

Signature of Provost (if applicable)

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

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

	Date	

Signature, Chair, UAF Faculty Senate Curriculum Review Committee

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

for Katrin Iken	Date	8/23/2010
Signature, Chair, Program/Department of:	GPMSL	
	Date	8/23/2010
Signature, Chair, College/School Curriculum Council for:	SFOS	
	Date	8/24/10
Signature, Dean, College/School of:	SFOS	

ATTACH COMPLETE SYLLABUS (as part of this application).

Note: The guidelines are online: http://www.uaf.edu/uafgov/faculty/cd/syllabus.html

The department and campus wide 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 change will 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.)

11. Support Services:

☐ Describe the student support services such as tutoring (local and/or regional) appropriate for the course.

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.

☐ State that you will work with the Office of Disabilities Services (208 WHIT, 474-5655) to provide reasonable accommodation to students with disabilities."

MSL 663/463: Chemical Coastal Processes

Instructor: Dr. Ana M. Aguilar-Islas
School of Fisheries and Ocean Sciences
335A Irving II
474-1524
amaguilarislas@alaska.edu

Class meeting times: TBA
Location: TBA
Office Hours: TBA

Prerequisites: Graduate standing; upper-division undergraduate with permission of instructor.
Recommended: General Chemistry, Chemical Oceanography

Course Description
This course investigates chemical processes in the coastal ocean. We will examine chemical interactions at different boundaries, and gain an understanding of how physical and biological processes affect the chemistry of coastal environments. In addition to participation during lectures, students will be evaluated based on four homework assignments, a research paper (graduate students), an oral presentation (all students), two midterms and a final.

Learning Objectives:
1. Become familiar with chemical processes occurring in coastal/shelf waters.
2. Identify physical and biological controls affecting the distribution and behavior of chemical species.
3. Critically evaluate the direction of future coastal/shelf research.
4. Apply topics examined during lectures to Alaskan coastal waters

Course Policies and Requirements
Lecture **attendance** and active **participation** in class is expected from all students. Class participation will count for 10% of the final grade.

Email communication will be used to distribute class information, updates and changes.

Four **homework assignments** will be given. Collaboration among students is encouraged. However, each student is expected to submit their own work. Homework assignments will not be accepted after the due date, unless arrangements have been made in advance with the instructor.

Exams. There will be two midterms and one final which are to be completed during the regular class period. The exams will be closed-book, and will require short-essay and diagramed answers. The final exam will be comprehensive with an emphasis on material covered after the second midterm.

Background Readings. There is no required textbook. Reading assignments will come from several books and the primary literature. Chapters from textbooks will be found on eReserves (http://eres.uaf.edu/eres/default.aspx) PASSWORD: TBA. Primary literature articles will be obtained from the library (http://library.uaf.edu/findarticles). Contact the instructor or a librarian if you need help obtaining articles.

Research Paper. Graduate students will choose and investigate a well-defined, focused topic that will be written as a paper. You are to choose an Alaskan coastal region and synthesize 2 to 4 key journal articles on the particular chosen topic and write a synthesis overview.

1. Topics will be selected during the first week of April. You will need instructor approval before moving ahead. This is to ensure you are "on track" with a focused topic.
2. An outline with chosen references will be due on April 12
3. The paper will be due in class on April 26.
4. The body of the term paper should have 1.5 line spacing, size 12 font (Time or Times New Roman) and 1 inch margins – it should be approximately 9 to10 pages with appropriate figures and tables inserted into the text.
5. All tables and figures need to have proper headings or captions, they need to be properly referenced, and will be incorporated into the main body of the text.
6. Reference format:
   In the body of the text "The concept of new production (Eppley and Peterson, 1979) has provided valuable insight ..."
   In the **Reference** section at the end of the paper:
   "Eppley, R.W., and B.J. Peterson. 1979. Particulate organic matter flux and planktonic new production in the deep ocean. Nature, **282**: 677-680."
7. The synthesis needs to be in your own words. It is OK to directly use a sentence from one of the articles as long as you use quotes and reference it properly.

Topic selection – remember that it has to be a focused paper from a **chemical coastal process perspective**. For example, a paper on trace metals in seawater is not acceptable, but a focused paper on sources of mercury in the Aleutian Archipelago would be acceptable. Similarly, a paper on organic matter in seawater is not acceptable, but a focused paper on input of organic matter by the Yukon River would be acceptable.

Student Presentations: All students will make an oral presentation. Graduate students will present highlights from their research paper. Undergraduate students will present highlights from one journal article describing a chemical process within an Alaskan coastal region (topic and reference to be approved by instructor by April 21st). Presentations will take place during the last week of lecture (May 3rd and 5th).

Lack of **academic integrity** including plagiarism is not acceptable and will not be tolerated.

Points and grading scale:

	Possible points	% of Total
Attendance and active class participation	50	10
Homework (4 assignments)	100	20
Midterm 1	75	15
Midterm 2	75	15
Paper/Presentation	100	20
Final	100	20
Total	**500**	**100**

A+	98-100%	A	93-97%	A-	90-92%
B+	87-89%	B	83-86%	B-	80-82%
C+	77-79%	C	73-76%	C-	70-72%
D+	67-69%	D	63-66%	D-	60-62%
		F	< 60%		

Support and Disability Services

At UAF, the Office of Disability Services (203 WHIT; 474-5655; TTY 474-1827; fydso@uaf.edu) ensures that students with physical or learning disabilities have equal access to the campus and course materials. If you have specialized needs, please contact this office or the instructor to make arrangements.

Lecture Schedule (Subject to change)

Week	Date	Lecture Topic	Assignment	Reading
1	1/20	Introductions, overview, logistics		
2	1/25	Coastal zone classification review		Open University Ch. 5-8
	1/27	Chemical composition and mixing		
3	2/1	Residence time and input variability		Eyre, 1998
	2/3	Floculation processes	**hmw1 Due**	Boyle et al., 1974; Sholkovitz, 1976
4	2/8	Organic speciation of trace metals	hwk1 returned	van den Berg, 2000; Buck et al., 2005
	2/10	The roll of Suspended particles		Turner and Millward, 2002
5	2/15	Photochemical Processes		Sulzberger, 2000
	2/17	Photochemical Processes (cont.)	**hmw2 Due**	Moran & Zepp, 2002
6	2/22	**Midterm 1**	hwk2 returned (2/21, office)	
	2/24	Carbonate system; Coastal Acidification	Midterm 1 returned	Emerson & Hedges Ch.4
7	3/1	Coastal Acidification (cont.)		Borges & Gypens, 2010
	3/3	Dissolved Oxygen; hypoxia/anoxia		Grantham et al., 2004
8	3/8	Interactions at sediment/water interface	**hmw3 Due**	Presley and Trefry 1980; Libes Ch.12
	3/10	Sedimentary transformation of organic matter		Artemyev Ch. 4
SPRING BREAK				
9	3/22	Sedimentary transformation of trace metals	hmw3 returned	
	3/24	The role of bacteria		
10	3/29	The influence of sea ice		Melnikov Ch. 3
	3/31	**Midterm 2**		
11	4/5	Isotopes as tracers	**Topic Due.** Midterm 2 returned	Libes Ch. 5
	4/7	Isotopes as tracers (cont.)	**hmw4 Due**	Swarzenski et al., 2000
12	4/12	Upwelling, fronts and eddies review	**Outline/References Due**	
	4/14	Controls on coastal productivity	hmw4 returned	Alongi Ch 7
13	4/19	Controls on coastal productivity (cont.)		Hutchins et al., 1998
	4/21	Interdisciplinary coastal research		Oceanography, 21(4): 90-107,
14	4/26	Coastal Observing Systems	**Paper Due**	
	4/28	Future challenges and coastal management		Valiela Ch 14
15	5/3	Student Presentations		
	5/5	Student Presentations	Papers Returned	
16		**Final Exam**		

Texts

Alongi, D.M. (1998) *Coastal Ecosystem Processes*. CRC Press, Boca Raton, FL, 419 pp.

Artemyev, V.E. (1996) *Geochemistry of Organic Matter in River-Sea Systems*. Kluwer Acedemic Publishers, Dordrecht, 190 pp.

Emerson, S. and Hedges, J. (2008) *Chemical Oceanography and the Marine Carbon Cycle*. Cambridge University Press, Cambridge, 453 pp.

Libes, S.M. (1992) *An introduction to Marine Biogeochemistry*. John Wiley & Sons, Inc., New York, 734 pp.

Melnikov, I.A. (1997) The Arctic Sea Ice Ecosystem. Gordon and Breach Science Publishers, Amsterdam, 204 pp.

The Open University (1997) *Waves, Tides and Shallow-Water Processes*. Butterworth-Heinemann, Oxford, 187 pp.

Valiela, I. (2006) *Global Coastal Change*. Blackwell Publishing, Malden, MA, 368 pp.

Articles

Borges, A. V. and N. Gypens. 2010. Carbonate chemistry in the coastal zone responds more strongly to eutrophication than to ocean acidification. Limnology and Oceanography, **55**(1): 346–353

Boyle, E.A., R. Collier, A.T. Dengler, J.M. Edmond, A.C. Ng, and R.F. Stallard. 1974. On the chemical mass-balance in estuaries. Geochimica et Cosmochimica Acta, **38**: 1719-1728.

Buck, K.N., J.R.M. Ross, and K.W. Bruland. 2007. A Review of total dissolved copper and its chemical speciation in San Francisco Bay, California. Environmental Research **105**: 5-19

Eyre, B. 1998. Transport, Retention and Transformation of Material in Australian Estuaries. Estuaries 21(4A): 540-551

Grantham, B.A., F. Chan, K. J. Nielsen, D. S. Fox, J. A. Barth, A. Huyer, J. Lubchenco, and B. A. Menge. 2004. Upwelling-driven nearshore hypoxia signals ecosystem and oceanographic changes in the northeast Pacific. Nature, **429**: 749-753.

Hutchins, D.A., G. R. DiTullio, Y. Zhang and K. W. Bruland. 1998. An iron limitation mosaic in the California upwelling regime. Limnology and Oceanography, **43**(6): 1037-1054

Moran, M.A. and R.G. Zepp. 2002. Role of Photoreactions in the Formation of Biologically Labile Compounds from Dissolved Organic Matter. Limnology and Oceanography, **42**(6): 1307-1316

Presley, B.J., and J.H. Trefry. 1980. Sediment-water interactions and the geochemistry of interstitial waters.

Salisbury J., M. Green, C. Hunt and J. Campbell. 2008. Coastal acidification by rivers: A new threat to shellfish? Eos, Transactions, American Geophysical Union **89**(50):513

Sholkovitz, E.R. 1976. Flocculation of dissolved and inorganic matter during the mixing of river water and sea water. Geochimica et Cosmochimica Acta, **40**: 831-845.

Sulzberger, B. 2000. Photooxidation of Dissolved Organic Matter: Role for Carbon Bioavailability and for the Penetration Depth of Solar UV-Radiation. In: Gianguzza, A., Pelizzetti, E., and Sammartano, S. (eds.), *Chemical Processes in Marine Environments*. Springer, Berlin, pp.75-90.

Swarzenski, P.W., Corbett, D.R., Smoak, J.M., and McKee, B. 2000. The use of U-Th series radionuclides and transient tracers in Oceanography: An overview. In: Hester, R.E., and Harrison, R.M. (eds.), *Chemistry in the Marine Environment*. Royal Society of Chemistry, Cambridge, 98 pp.

Turner, A. and G. E. Millward. 2002. Suspended Particles: Their Role in Estuarine Biogeochemical Cycles. Estuarine, Coastal and Shelf Science, **55**: 857–883

Van den Berg, C.M.G. 2000. Organic Complexation of Metals in Seawater. In: Gianguzza, A., Pelizzetti, E., and Sammartano, S. (eds.), *Chemical Processes in Marine Environments*. Springer, Berlin, pp.189-200.

Curriculum Committee SFOS

Members: Trent Sutton (Chair)
Katrin Iken
Jeremy Mathis

20 August 2010

Trial Course
Course Number: MSL 494/694
Course Title: Chemical Coastal Processes
Instructor: Ana Aguilar-Islas
First Time of Offering: Yes

General Recommendations:

None

Faculty Senate Form:

Clarify and Address the following:

- Please change the course from a new to a trial course by checking the trial course box.
- Please add Christina Neumann's email address (clneumann@alaska.edu) to the email contact line in addition to your email address.
- For prerequisites, the committee believes that this line should state "General chemistry or graduate standing (600 level) or permission of instructor (400 level)." The only recommended course then would be Chemical Oceanography.
- Section 15, state "None" for special restrictions.
- Section 16, state "$0" for course fees.
- In the justification, eutrophication is misspelled.

Syllabus:

- Looks great, no suggestions.

EMailed 8/20/10