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.

SUBMITTED BY:			<u> </u>	W COURSE F					
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Department	MSL	***************************************		College/Schoo	ol		SFOS		
Prepared by	epared by Peter Winsor nail Contact pwinsor@alaska.edu		Phone Faculty Contact			907 474 7740 Peter Winsor			
Email Contact					act				
	clneumann@alas	ka.edu							
1. ACTION DE	SIRED (CHECK O	V <i>E</i>):	Trial Cou	rse	1	New Course	х		
2. COURSE ID	ENTIFICATION:	Dept	MSI	L Course	# 403	No. of Credi	ts 3		
	/lower division ber of credits:					rine Science, and of marine estuario			
3. PROPOSED COURSE TITLE:			Estuaries Oceanography						
4. To be CROSS YES/NO		No		, Dept:		ırse#			
(Requires appr	oval of both departmen	its and deans inve	olved. Add li	ines at end of forn	n for such signatu	ures.)			
5. To be STACK YES/NO	ED?	No	If yes	, Dept.	Cou	rse#			
6. FREQUENC	Y OF OFFERING:	Fall							
_			ng, Summer		umbered Years, o	or Odd-numbered	Years) — or As		
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justification is needed, attach on separate sheet.) H = Humanities S = Social Sciences
Will this course be used to fulfill a requirement YES NO X
for the baccalaureate core?
IF YES, check which core requirements it could be used to fulfill: O = Oral Intensive, Format 6
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? Zero 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?
13. GRADING SYSTEM: Specify only one. LETTER: X PASS/FAIL:
RESTRICTIONS ON ENROLLMENT (if any)
14. PREREQUISITES Introduction to Marine Science II (MSL 213), Stat 200 or permission of instructor
These will be <i>required</i> before the student is allowed to enroll in the course.
RECOMMENDED Classes at that student is strongly encouraged to complete prior to this course.
Classes, etc. that student is strongly encouraged to complete prior to this course.
15. SPECIAL RESTRICTIONS, CONDITIONS None
16. PROPOSED COURSE FEES none
Has a memo been submitted through your dean to the Provost & VCAS for fee approval? N/A
18 DDELTANG WYGMADU
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.
This class will be given by Dr. Winsor as part of his annual teaching requirement. There is no impact expected on budget, facilities or faculty.
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) has been established
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 proposed Marine Sciences Minor program by providing students with an in-depth knowledge of Estuaries, their oceanography and coupled ecosystems.
21. POSITIVE AND NEGATIVE IMPACTS
Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.
The proposed new course will have a positive impact on the proposed Marine Sciences Minor program by providing students with oceanography experience and scientific literature and writing.

2

11. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If

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.

This class is aimed as a higher-level class for the MSL minor program in Marine Science. Currently there is no class within UAF that gives an understanding of estuaries and their oceanography and coupling to ecosystems. Estuaries are areas where all disciplines within marine science meet; physical oceanography, marine biology and fisheries (both freshwater and saltwater). One goal of Estuaries is for students to become familiar with the scientific method, reading substantial scientific literature and perform scientific writing.

APPROVALS:		·	·		
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Signature, Chair, Program/Department of:	6 P715	<u></u>		V	
JustSett		Da	te	01/06/11	
Signature, Chair, College/School Curriculum	Council for:	SFOJ			
Jakl July		Dat	e [1/10/11	
Signature, Dean, College/School of:	0 /10	2			
		Dat	e		
Signature of Provost (if applicable) Offerings above the level of approved progr	rams must be ap	proved in advance	by t	he Provost.	
ALL SIGNATURES MUST BE OBTAINED	PRIOR TO SU	BMISSION TO T	HE G	OVERNANCE	OFFICE
		Dat	. [
Signature, Chair, UAF Faculty Senate Curr	riculum Review C	ommittee	-		
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ADDITIONAL SIGNATURES: (As needed for	cross-listing and	or stacking)			
		Dat	. [
Signature, Chair, Program/Department of:					
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Signature, Chair, College/School Curriculum	Council for:				
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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:
\Box Title, \Box number, \Box credits, \Box prerequisites, \Box location, \Box meeting time (make sure that contact hours are in line with credits).
2. Instructor (and if applicable, Teaching Assistant) information:
\square Name, \square office location, \square office hours, \square telephone, \square email address.
3. Course readings/materials:
\square Course textbook title, \square author, \square edition/publisher.
\square Supplementary readings (indicate whether \square required or \square 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 <i>strongly</i> 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. <u>Be specific</u> 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:
\square Specify how students will be evaluated, \square what factors will be included, \square 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."

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MSL 403 ESTUARIES OCEANOGRAPHY Syllabus – Autumn Semester 2012

Instructor:

Dr. Peter Winsor, Associate Professor of Marine Science.

Rm. 123 O'Neill building

Phone: 474-7740

Email: pwinsor@sfos.uaf.edu

Office hours:

Monday, Wednesday and Friday 11-12 am. In addition, you can also see me at the end of class and we will either meet then, or set up an appointment to meet later. Generally, email is an excellent way to get in touch with me. You may also call or e-mail for an appointment. If you leave a voicemail, please include your e-mail address in your message.

Course Description

Advanced class for Marine Science minors, offering an overview of the oceanography of estuaries. The class involves lectures, reading assignments, reviewing and criticizing scientific literature.

Prerequisites: MSL 213, Stat 200 or permission of instructor. 3 credits (3 + 0). Offered Fall.

Course Goals and Learning Objectives

This class is intended to be of use to undergraduate and graduate students from all the sciences. While familiarity with physical oceanography and differential equations is useful, it is not required. If there are widely disparate backgrounds, we may make different versions of the problem sets.

We will study the physical-biological coupling in a wide range of estuarine systems from around the world. Students will develop a core understanding of physical and biological processes that can be applied to fisheries, geology and chemical oceanography problems in estuaries and elsewhere.

Topics include tides, vertical mixing, circulation, coastal plain estuaries, hypoxia, harmful algal blooms and plankton distributions within estuaries.

We focus on important physical estuarine processes and their consequences:

- Effects of circulation and mixing on residence time and patterns of phytoplankton and zooplankton
- Development of hypoxia and its effects on biology
- Harmful algal blooms

The course will consist of lectures, reading assignments, student-led discussions of research papers, and occasional guests. Students will write a number of short response essays based on the reading, and a longer paper on a topic of their choice. Students will give a short presentation on their final paper in the last week. There will be a final exam. Each core lecture is followed by assignments and mandatory written work by each student.

Class is given on Monday, Wednesday and Friday at 10:15-11:15. Monday's are usually devoted to lectures, Wednesday's we go through literature and reading assignments, and Friday's are devoted to student presentations and discussions.

This course will give the students a broad base of knowledge of oceanography within estuaries and coupled physical-biological systems. The goal is for each student to develop a toolbox of techniques to apply to various scientific problems they encounter in estuarine systems, and to get exposed to reading, reviewing and criticizing scientific literature.

Special Needs

The Office of Disability Services (203 WHIT; 474-7043) implements the American with Disabilities Act and insures that UAF students have equal access to the campus and course materials. Students with disabilities can be assured that they will be provided with reasonable accommodation. If you need course adaptations or accommodations because of a disability, please contact the instructor as soon as possible to make the necessary arrangements. In addition, if extra instruction on equipment usage, explanation of course concepts, or assistance with data analyses is required, the student is encouraged to contact the instructor and/or teaching assistant.

Reading assignments

Required text for Estuaries 403 is Dyer, K. R., 2011: Estuaries: Dynamics, Mixing, Sedimentation and Morphology, Cambridge University Press. This book is available from the University bookstore and online and is not very expensive.

We will also provide handouts from an older text book; Dyer, K. R., 1997: Estuaries, A Physical Introduction, 2nd Edition. John Wiley & Sons, Chichester, 195 pp.

A new text book is being printed in 2011: Contemporary Issues in Estuarine Physics Valle-Levinson, Cambridge University Press, ISBN-13: 9780521899673. We will hopefully be able to use parts of this text book when available.

Copies of scientific papers needed for class will be handed out during class and will also be available online via UAF Blackboard.

Exams and Reading Essays

A final exam will be administered during the semester and is valued at 125 points. In all cases, students will not be allowed to retain copies of the final exam. The reading essays are in the form of a "Reading Question" (RQ), where the student is asked to formulate

(and attempt to answer) a detailed question based on reading of a scientific paper. This in intended as practice in analytical, critical reading and writing. Detailed comments will be given on each student's essays

There will also be four Quizzes given during the semester based on the topics covered in the class. Extra credit writing assignments will be handed out. These are for extra credit only and are not required.

Class participation

Students are expected to attend class. During a recent semester, even though there was no direct penalty for non-attendance, the average success of students who did not attend regularly was poor. Assignments and RQ's will be presented, assigned and handed out at each lecture so it is important to be present.

Course Policies

Students should be familiar with the UAF Honor Code, which can be found in the course catalog. All written work, including projects, class questions, reports, and extra credit reviews, must be the work of the student submitting it and not copied from another source, such as another student (past or present).

Incompletes (I) will be given only to those students who have received permission from the instructor to complete course work after April 30 (final exam day). In accordance to UAF policy Incomplete grades will be changed to an "F" grade.

Grading

Grading will be based on your point total for the semester, as follows:

Quizzes (4): up to 50 points RQ #1: up to 50 points RQ #2: up to 50 points RQ #3: up to 50 points RQ #4: up to 50 points Final exam: up to 125 points

Total: 275 points

Extra Credit hand in assignments: up to 20 points. Late assignments will be docked 10% of the total point value for each day late and missed exams will be assigned a zero score.

Grading scale:

 248 points and above
 = A

 220 to 247 points
 = B

 192 to 219 points
 = C

 165 to 191 points
 = D

 164 points and below
 = F

The grading policy will not use (+/-) values.

The grading scale is based in 10% steps. The instructors may adjust the grade boundaries somewhat, if warranted based on evidence of student participation and learning. This rarely occurs except at the lower boundaries for C and D grades.

MSL 403 ESTUARIES OCEANOGRAPHY Tentative Schedule

Each week has three lectures (Monday, Wednesday and Friday). Generally, Monday lectures go through relevant chapters from the class books and prepare the students for the Wednesday literature assignments. Friday's are devoted to student presentations and discussions.

Week 1: Introduction: What estuaries are like and why

- Class organization, estuary and fjord definitions, water quality and habitat issues.
- Geomorphology: how do estuaries evolve over interglacial time scales (erosion, deposition, sea level rise, biological effects)? Classification: the range of observations and the quest for simple explanations.
- Simple mass and salt conservation: Knudsen's Relation
- Dyer (1997) Estuaries: A Physical Introduction, pages 1-22

Week 2: Tides

- Definitions, Celestial Forcing, Equilibrium Tides.
- Solutions in bays (1/4 wave oscillator)
- Tidal excursion, ellipse, prism.
- Spring and neap: effects of multiple frequencies.
- Effects of friction and non-linearity: ebb and flood dominance, phase shifts, residuals, and overtides.
- Influence on marine biology and fisheries.
- Lavelle et al. (1988) Model of Puget Sound Tides
- Moffeld and Larsen (1984) Observed Puget Sound Tides (RQ)

Week 3: Turbulence: Vertical Fluxes of Momentum and Buoyancy

- Microstructure Measurement
- Boundary layers, log layer, drag coefficient, wind stress
- Tidal Mixing
- Critical Richardson Number
- Seim and Gregg (1994) Admiralty Inlet Mixing

Week 4: Flow Over Sills & Through Contractions

- One- and 2-Layer Hydraulics
- Strait of Gibraltar
- Bosporus to Black Sea

- Wesson and Gregg (1994) Gibraltar
- Geyer and Cannon (1982) Deep Water Renewal in a Fjord

Week 5: Coastal Plain Estuaries

- Chesapeake Bay
- Tyler and Seliger (1989) Bio-physical Interactions
- Carter and Pritchard (1988) Chesapeake Overview
- Dyer (1997), Chapter 9.

Week 6: Fjords

- Puget Sound
- Cokelet et al. (1991) Pollution Ages in PS
- Ebbesmeyer et al. (1988) PS Overview
- Lavelle et al. (1991) Dense Flow over Admiralty Inlet
- Dyer (1997), Chapter 8.

Week 7: Well-Mixed Estuaries, Salt Wedges, and Other Effects

- San Francisco Bay
- Conomos et al. (1985) SF Bay Overview
- Walters et al. (1985) Time Scales of Flow in SF Bay
- Fraser River, Colombia River
- Gever and Farmer (1989)
- Hughes and Rattray (1980)
- Channel Shape, Headlands, Coriolis, Fronts
- Signell and Geyer (1988) Tidal Flow around a Headland

Week 8: Development of hypoxia and its effects on biology

- Gulf of Mexico
- Deep sill fjords
- Baltic Sea
- Rabalais, Turner and Wiesman (2002)

References:

- Cameron, W. M., and D. W. Pritchard, 1963: Estuaries. In: The Sea (Ed. M. N. Hill), Vol. 2, Wiley, New York, 306-324.
- Carter, H. H. and D. W. Pritchard, 1988: Oceanography of Chesapeake Bay. Hydrodynamics of Estuaries: II Estuarine Case Studies, B. Kjerfve, Ed., CRC Press, 1-16.
- Cokelet, E. D., R. J. Stewart, and C. C. Ebbesmeyer, 1991: Concentrations and ages of conservative pollutants in Puget Sound. Puget Sound Research '91, Vol. 1, Puget Sound Water Quality Authority, 99-108.
- Conomos, T. J., R. E. Smith, and J. W. Gartner, 1985: Environmental setting of San Francisco Bay. Temporal Dynamics of an Estuary: San Francisco Bay, J. E. Cloern and F. H. Nichols, Eds., Dr. W. Junk Publishers, Kluwer Academic, 1-12.
- Dyer, K. R., 1997: Estuaries, A Physical Introduction, 2nd Edition. John Wiley & Sons, Chichester, 195 pp.

- Ebbesmeyer, C. C., J. Q. Word, and C. A. Barnes, 1988: Puget Sound: a fjord system homogenized with water recycled over sills by tidal mixing.
 Hydrodynamics of Estuaries: II Estuarine Case Studies, B. Kjerfve, Ed., CRC Press, 17-30.
- Geyer, W. R. and G. A. Cannon, 1982: Sill processes related to deep water renewal in a fjord. J. Geophys. Res., 87, 7985-7996.
- Geyer, W. R. and D. M. Farmer, 1989: Tide-induced variation of the dynamics of a salt wedge estuary. J. Phy. Oceanogr., 19, 1060-1072.
- Hansen, D. V., and M. Rattray, 1966: New dimensions in estuary classification. Limnol. Oceanogr., 11, 319-326.
- Hughes, R. P., and M. Rattray, 1980: Salt flux and mixing in the Columbia River Estuary. Est. Coast. Mar. Sci., 10, 479-494.
- Lavelle, J. W., E. D. Cokelet, and G. A. Cannon, 1991: A model study of density intrusions into and circulation within a deep, silled estuary: Puget Sound. J. Geophys. Res., 96, 16 779-16 800.
- Lavelle, J. W., H. O. Mofjeld, E. Lempriere-Doggett, G. A. Cannon, D. J. Pashinski, E. D. Cokelet, L. Lytle, and S. Gill, 1988: A multiply-connected channel model of tides and tidal currents in Puget Sound, Washington and a comparison with updated observations. NOAA Tech. Memo. ERL PMEL-84, Pacific Marine Environmental Laboratory, NOAA.
- Mofjeld, H. O. and L. H. Larsen, 1984: Tides and Tidal Currents of the Inland Waters of Western Washington. NOAA Tech. Memo. ERL PMEL-56, Pacific Marine Environmental Laboratory, NOAA.
- Rabalais, N. N., R. E. Turner, and W. J. Wiseman, 2002: Gulf of Mexico Hypoxia, a.k.a. "The Dead Zone", Ann. Rev. Ecology and Systematics, 33, 235-263.
- Seim, H. E. and M. C. Gregg, 1994: Detailed observations of a naturally occurring shear instability. J. Geophys. Res., 99, 10 049-10 073.
- Signell, R. P., and W. R. Geyer, 1990: Numerical simulation of tidal dispersion around a coastal headland. Residual currents and long-term transport, R. T. Cheng, Ed., Springer-Verlag, 210-222.
- Tyler, M. A., H. H. Seliger, 1989: Time scale variations of estuarine stratification parameters and impact of the food chains of the Chesapeake Bay. In Estuarine Circulation, B. J. Neilson, J. Brubaker and A. Kuo, Humana Press, Clifton, NJ, 201-233.
- Walters, R. A., R. T. Cheng, and T. J. Conomos, 1985: Time scales of circulation and mixing processes of San Francisco Bay waters. Temporal Dynamics of an Estuary: San Francisco Bay, J. E. Cloern and F. H. Nichols, Eds., Dr. W. Junk Publishers, Kluwer Academic, 13-36.
- Wesson, J. C., and M. C. Gregg, 1994: Mixing at Camarinal Sill in the Strait of Gibraltar. J. Geophys. Res., 99, 9847-9878.

Curriculum Committee SFOS

Members: Trent Sutton (Chair)

Katrin Iken
Jeremy Mathis
Andre Lopez

08 December 2010

New Course

Course Number: MSL 403 Course Title: Estuaries Instructor: Winsor

First Time of Offering: Yes

General Recommendations:

On the last page of the course proposal form is a checklist of components to be included in the syllabus. Be sure to go through this checklist to make sure all components are addressed. Failure to do so could result in the delay of getting this course proposal through the UAF Curriculum Review Committee. Also, undergraduate and graduate students do not like to take 2-credit courses. Consequently, you should expect low enrollment for this course. The Curriculum Committee recommends offering the course for 3 credits.

Faculty Senate Form:

Clarify and Address the following:

- For course identification section, need to state that the proposed Marine Science minor has been submitted concurrently.
- Frequency of offering every fall? Seems too often as this will most likely be a low demand course.
- The catalog description (section 10) must appear as it will in the actual catalog; you must include the credits, prerequisites, and course format (e.g., 2+0); you only had the course title and description. Your course description must match the syllabus. You listed this as a 3-credit course in this section. Also, the last line of the course description is not reflected in the course content. This course appears to be more focused on physical oceanography and course content does not match the title.
- Course needs to be letter grade. Students will not take a pass/fail course at the undergraduate level.
- Prerequisites List MSL 212 or concurrent enrollment. No need to include MSL 211 as is a prereq for MSL 212 and is implied.
- Library collections Need to contact the library and include the date that made the call and talked to Anne Christie. Without that information, this proposal will get rejected by the UAF CRC.

- Estimated impact Will this course be taught as part of your regular workload?
 Need to state that the paperwork for the minor has been submitted concurrently.
- Section 21. There are no positive impacts associated with this course?

. . . .

• Justification. Remove the last line of the justification. Based on the course topics listed on the syllabus schedule, this course will not provide a core understanding of estuaries. This issue must be resolved.

Syllabus:

- Office hours must be listed and posted, cannot be by appointment (UAF policy).
- The course description on the syllabus must match the course description on the form (UAF requirement). Overall, the course description is very vague.
- Need a goal and learning outcomes.
- Course requirements How many essays, what is short versus long, etc. Need detailed information on course requirements that link back to the course schedule. Are there any exams?
- Need sections on student accommodations and disabilities services.
- For the incomplete grade section. Last line, change to reflect that incompletes will be changed to an F grade (this is UAF policy).
- How many points and percentages to get an A, B, C, etc.? How many total points for the class? Nothing provided on the graded components (points, percentages, grading scale). Need to be very clear in this section.
- Course schedule has no timeline. Where are the readings located? Handouts? On reserve? Blackboard?
- Please proof the syllabus as there are several typographical errors.