

10-UNC

FORMAT 1

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.

NEW COURSE PROPOSAL

SUBMITTED BY:

Department	IMS	College/ School	SFOS
Prepared by	Mark Johnson	Phone	474.6933
Email Contact	majohnson@alaska.edu	Faculty Contact	Mark Johnson

1. ACTION DESIRED

(CHECK ONE):

Trial Course	<input type="checkbox"/>	New Course	<input checked="" type="checkbox"/>
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2. COURSE IDENTIFICATION:

Dept	MSL	Course #	419	No. of Credits	3
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Justify upper/lower division status & number of credits:	Advanced undergraduate course to complete minor in marine science and provide foundation for graduate students in marine science and oceanography
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3. PROPOSED COURSE TITLE

Concepts in Physical Oceanography

4. To be CROSS LISTED?

YES/NO

NO	If yes, Dept:	Course #
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(Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)

5. To be STACKED?

YES/NO

NO	If yes, Dept.	Course #
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6. FREQUENCY OF OFFERING:

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

7. SEMESTER & YEAR OF FIRST OFFERING (AY2011-12

if approved by 3/1/2012; otherwise AY2012-13)

AY2013-fall

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
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OTHER FORMAT (specify)

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

9. CONTACT HOURS PER WEEK:

3	LECTURE hours/weeks	0	LAB hours/week		PRACTICUM hours/week
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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):

MSL420, Concepts in Physical Oceanography, 3 credits. Concepts in Physical Oceanography establishes the physical concepts that account for fluid motion of the oceans on our rotating earth. This course will include the role of the Coriolis force, ocean stratification, wind driven and thermohaline circulation, tides and the major ocean gyres and why they are present. The physical forces that influence biological production will be presented. These foundation concepts will be part of a well-rounded undergraduate program in marine science or establish the foundation for graduate students. (3+0) Offered Alternate Fall

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11. **COURSE CLASSIFICATIONS:** Undergraduate courses only. Consult with CLA Curriculum Council to apply Sor 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:

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

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

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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: Later changing the grading system for a course constitutes a Major Course Change.

LETTER PASS/FAIL:

RESTRICTIONS ON ENROLLMENT (if any)

14. **PREREQUISITES** MSL 211/213, or permission of instructor
These will be required before the student is allowed to enroll in the course.

15. **SPECIAL RESTRICTIONS, CONDITIONS** none

16. **PROPOSED COURSE FEES** \$0
Has a memo been submitted through your dean to the Provost for fee approval? no
Yes/No

17. **PREVIOUS HISTORY**

Has the course been offered as special topics or trial course previously? no
Yes/No

If yes, give semester, year, course #, etc.:

18. **ESTIMATED IMPACT**

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

Regular classroom space will be needed, instructor salary will be covered under the instructor's annual teaching workload.

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
The library (K. Jensen) was contacted on 12 June 2012. All course material will be available through the library, on-line and/ or via instructor

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)

This course offering will improve MSL program's ability to educate undergraduate students in marine science as part of the Minor in Marine Science, and it will prepare them for graduate studies.

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.

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.

A course on the physical concepts of oceanography is currently missing from the course offerings for the new Minor in Marine Science at UAF. The instructor has decades of teaching and research experience that will be applied to ensure that this program does not lower UAF standards.

APPROVALS: Add additional signature lines as needed.

Signature, Chair, Program/Department of: 6PMSL Date: 7/24/12

Signature, Chair, College/School Curriculum Council for: SFOs Date: 7/24/12

Signature, Dean, College/School of: STU Date: Aug 1, 2012

Signature of Provost (if applicable) Date: _____

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

Signature, Chair _____ Date _____

Faculty Senate Review Committee: Curriculum Review GAAC

Core Review SADAC

Syllabus for Concepts in Physical Oceanography

Number: MSL420

Credits: 3

Prerequisites: MSL 211/213, or permission by instructor

Location: as scheduled

Meeting time: MWF 10:00-11:00am

Instructor Name: Mark Johnson

Office location: O'Neill 111

Office hours: MWF 11-12am

Telephone: 474.6933

Email address: majohnson@alaska.edu

Readings/materials:

Course textbook title: Invitation to Oceanography

Author: Paul R. Pinet

Edition/publisher: Jones and Barlett Publishers, LLC

Supplementary required readings:

See Course calendar and lecture assignments for readings in these texts:

Introductory Dynamical Oceanography by Stephen Pond and G. Pickard

Dynamics of Marine Ecosystems by Kenneth Mann and John Lazier

Introduction to Physical Oceanography by John A. Knauss

Descriptive Physical Oceanography by George L. Pickard and William J. Emery

Introduction to Physical Oceanography by Robert H. Stewart

Course Description:

Course content includes descriptions of the physical forces that drive fluid motion critical to an understanding of fisheries, marine biology and oceanography. Students will be expected to think quantitatively. Prior exposure to calculus and physics is helpful but not necessary. This course establishes the physical concepts that account for fluid motion of the oceans on our rotating earth. This course will include the role of the Coriolis force, ocean stratification, wind driven and thermohaline circulation, tides and the major ocean gyres and why they are present. The physical forces that influence biological production will be presented. These foundation concepts will be part of a well-rounded undergraduate program in marine science or establish the foundation for graduate students. The goal of this course is to provide the advanced undergraduate with a conceptual overview of physical oceanography to ensure undergraduates in marine science are exposed to oceanography topics that are essential to understanding fisheries, marine habitats and global climate. This course also serves to complete the foundation for graduate students pursuing careers in marine science and related fields. The class will include lectures, case studies, and self-teaching. In this course:

- Students learn how to quantitatively think about the forces that drive upwelling, tides, waves and the major currents of the surface and deep ocean

- Students gain an understanding of oceanography concepts and will interpret graphs and diagrams that visually demonstrate the mathematical relationships fundamental to physical oceanography
- Students will be able to relate biological patterns in the oceans to physical drivers

Calendar: *3 hrs per week* ²⁴
 Each lecture is 2 hours for a total of 40 hours or 2400 minutes per Faculty Senate rules.

LECTURE	SUBJECT	ASSIGNED READING
1	Introduction	Stewart Ch 1;
2	Bathymetry, Basin Geomorphology	Pinet Ch 1,2; P&P Ch 1; P&E Ch 1.
3	Density and the Equation of State	Knauss Ch 1; Stewart Ch 3;
4	Vertical Mixing	P&P Ch 5;
5	Stratification	P&P Ch 5; Knauss Ch 2;
	Air-sea fluxes	Knauss Ch 3;
6	Ocean heat budget	P&E Ch 5; Stewart Ch 5;
7	Fundamental Concepts (Total Derivative, Lagrangian-Eulerian reference frames, centrifugal-centripetal force)	P&P Appendix I, pps 215-217, p 225;
8	The Coriolis effect	P&P Ch 6, pps 36-38; Pinet pps 186-207; Knauss p 90; M&L pps 111-116;
9	The Equations of Motion and Reynolds stresses	P&P Ch 8 pps 65-67; Knauss pps 108-115;
10	Geostrophy and pressure gradients	P&P Ch 8 pps 65-67; Knauss pps 108-115; M&L pps 116-118; Stewart Ch 7;
11	Margule's and Thermal Wind relations	
12	Ekman dynamics: convergence and upwelling and the relationship to biological production	P&P Ch 8, pps 81-97; M&L pps 161-174, 214-222, 297-303; Stewart Ch 10;
13	Vorticity	Stewart Ch 12; P&P pps 105-108;
14	The Sverdrup Balance	P&P Ch 9, pps 97-110; Stewart pps 183-188;
15	Western Intensification	Pinet Ch 6; P&P Ch 9, pps 110-119; Knauss Ch 7, pps 136-137; M&L 304-312;

		Stewart pps 189-195;
16	Waves	Pinet Ch 7, Knauss Ch 10, pps 218-233; M&L pps 312-315; Stewart Ch 16;
17	Tides and the role in biology	Pinet Ch 8; Knauss Ch 10, pps 234-243; M&L pps 255-267
17	Estuaries and biological productivity	Knauss Ch 11, pps 245-255; M&L 118-121; P&E pps 281-285; Stewart pps 308-311
19	Variability and climate change	M&L Ch 10, pps 384-401; selected papers tbd
20	Review; Q&A	

Course Policy:

Rules include no cell phones, no earphones and no disruptive behavior in class. Students with unexcused absences or habitual tardiness will have grades lowered. Make-up exams are possible when arranged in advance. Students who plagiarise will fail.

Grading:

Students will be evaluated when they ask questions in class and by their performance on the exams. There will be a mid-term and final exam, each with the same weight. Evaluation depends on how students answer the exam questions and whether they seem prepared when asking questions in class. Grades will be based 96% on exams and 4% on class participation. Grades will be assigned using a curve without the use of "+" or "-". The grading curve will depend on the number of correct answers students provide and cannot be predicted in advance. The applied curve will lead to grades of "A", "B", "C" with perhaps some "D"s and/or "F" grades. The curve will be based on >90%=A, 80-89.9%=B, etc. The student may ask questions in class, meet with the instructor during office hours, read on his or her own time, or use the web for additional information.

I will work with the Office of Disabilities Services. They may be contacted by email at uaf-disabilityservices@alaska.edu, by phone at (907)474-5655, or by TTY at (907) 474-1827.