

08-7th

LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
		07-43th	App-2/3/09	App-2/24/09

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

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Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

1. Course Proposals (check all that apply) <input type="checkbox"/> New Course <input type="checkbox"/> Course Prefix Change <input type="checkbox"/> Course Deletion <input checked="" type="checkbox"/> Course Revision <input checked="" type="checkbox"/> Course Number and/or Title Change <input checked="" type="checkbox"/> Catalog Description Change		
GEOS 361 Physical Oceanography	GEOS 370 Oceanography	
<i>Current Course prefix, number and full title</i>	<i>Proposed course prefix, number and full title, if changing</i>	
2. Additional Course Designations: check if appropriate <input type="checkbox"/> This course is also proposed as a Liberal Studies Course. <input type="checkbox"/> Other: (e.g., Women's Studies, Pan-African) <input type="checkbox"/> This course is also proposed as an Honors College Course.		
3. Program Proposals <input type="checkbox"/> New Degree Program <input type="checkbox"/> Program Title Change <input type="checkbox"/> Other <input type="checkbox"/> New Minor Program <input type="checkbox"/> New Track <input type="checkbox"/> Catalog Description Change <input type="checkbox"/> Program Revision		
<i>Current program name</i>	<i>Proposed program name, if changing</i>	
4. Approvals		
Department Curriculum Committee Chair(s)	<i>[Signature]</i>	Date 2/4/08
Department Chair(s)	<i>[Signature]</i>	2/4/08
College Curriculum Committee Chair	<i>[Signature]</i>	2-11-08
College Dean	<i>[Signature]</i>	2-11-08
Director of Liberal Studies *		
Director of Honors College *		
Provost *		
Additional signatures as appropriate: (include title)	<i>Joseph Domaradzi TECC</i>	1-26-09
	<i>Mary Ann Rafeth Dean COE-ET</i>	1-26-09
UWUCC Co-Chairs	<i>Gail Sedquist</i>	1-29-09

* where applicable

Received

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SEP 25 2008

FEB 14 2008

1
Liberal Studies Liberal Studies

Part II. Description of Curricular Change

1. SYLLABUS OF RECORD

I. Catalog Description

GEOS 370 Oceanography

3c-3l-4cr

Prerequisite: Grade of C or better in GEOS 201 and GEOS 202

An introduction to physical, chemical, geological, and biological nature of the ocean: bathymetry, submarine geology, and sedimentary deposits. Includes field trip(s) which may occur on weekend(s).

II. Course Objectives

At the end of this course students will be able to:

- 1) summarize the origin of the Earth and the Oceans and how plate tectonic processes influence oceanographic systems.
- 2) explain the interactions between the oceans and the atmosphere, the lithosphere and the biosphere.
- 3) integrate their knowledge of above-mentioned content areas to synthesize the role the oceans play in global change.
- 4) evaluate the resource potential offered by the world's ocean and the economic, political, and societal impact these resources.

Student outcomes assessment matrix

Conceptual Framework (Danielson Domain)	Content Standard (NSTA Science Teacher Preparation)	Course Objective	Assessment (*denotes key assessment for reporting purposes)
1	1a, 1b	1	Lec Exam#1* , Final Exam, Final Lab Exam and Lab Exercises
1	1a, 1c	2	All lecture and lab exams, Lab Exercises
1	1c, 3a, 4a	3	Lec Exam #2, Lec Final Exam, Final Lab Exam, Lab exercises (Thermo-Haline Circulation Lab*)
1	1c, 4a	4	Lec Final Exam, Lab Final Exam and Lab Exercises

III. Course Outline

Lecture

Part A (16 academic hours): Marine Geology

1. Origin of the ocean basins and tectonic history
2. Seafloor bathymetry
3. Coastal marine provinces

4. Abyssal provinces
5. Lithogenous sediments
6. Biogenic sediments

Exam 1 (1 academic hour)

Part B (12 academic hours): Marine Chemistry

1. Properties of seawater
2. Density driven currents – thermohaline currents
3. Wind driven surface circulation
4. El Nino connections

Exam 2 (1 academic hour)

Part C (12 academic hours): Marine Ecosystems

1. Primary productivity
2. Chemosynthesis
3. Marine food chain
4. Marine policy

Final exam during final exam period.

Laboratory Exercises (3 academic hours each)

- Week 1: Tools of Oceanography
- Week 2: Bathymetric Maps
- Week 3: Plate Tectonics
- Week 4: Ocean Sediments in Space and Time
- Week 5: Carbonate Sediments
- Week 6: Beach Processes and Sediments
- Week 7: Lab Midterm Exam
- Week 8: Seawater Properties
- Week 9: Thermohaline Model
- Week 10: Atmospheric and Oceanic Circulation
- Week 11: Field Trip – coastal erosion
- Week 12: Marine Biology
- Week 13: Marine Ecosystems
- Week 14: Lab Final Exam

IV. Evaluation Methods

Each component of the course will contribute to final grade as follows:

Exam 1	20%
Exam 2	20%
Final Exam	25%
Laboratory Exercises	15%
Laboratory Midterm Exam	10%
<u>Laboratory Final Exam</u>	<u>10%</u>
Total	100%

V. The final grade for this course will be determined using the following schedule:

A=90-100%; B=80-89%, C=70-79%, D=60-69%, F=<60%

VI. Attendance Policy

The attendance policy will conform to IUP's undergraduate course attendance policy.

VII. Required textbooks, supplemental books and readings

Thurman, H., and Burton, E. *Introductory Oceanography*. Upper Saddle River, New Jersey: Prentice Hall Publishing, 2005.

VIII. Special resource requirements

There are no special resource requirements for this course.

IX. Bibliography

In addition to the required textbook and supplemental readings from current literature, the following will be used to develop the course curriculum:

- Bekker, A., et al. (2004) Dating the rise of atmospheric oxygen, *Nature*, 427, p.177-120.
- Broecker, W. S., (1997) Thermohaline circulation, the Achilles heel of our climate system: Will man-made CO₂ upset the current balance?, *Science*, 278, p. 1582-1588.
- Buesseler, K. and Boyd, P., (2003) Will ocean fertilization work?, *Science*, 300, p.67-68.
- Bullard, E. (1969) The origin of the oceans, *Scientific American*, 221, p. 66-75.
- Irion, R. (1998) Instruments Cast Fresh Eyes on the Sea, *Science*, 281, p. 194-196.
- Kennett, J. (2002) Methane hydrates in Quaternary climate change: The smoking gun hypothesis, Washington, D.C., American Geophysical Union.
- Milliman, J. D. ed. (1998) Deep sea biodiversity: A compilation of recent advances in honor of Robert. R. Hessler, *Deep-Sea Research*, 45, p. 1-12.
- Philander, G. (2001) El Niño Southern Oscillation phenomena, *Nature*, 302, p. 295-301.
- The Open University Course Team, (1989) *Ocean chemistry and deep-sea sediments*, Oxford: Pergamon Press, 211pp.

2. SUMMARY OF PROPOSED REVISIONS

The original format for the class was two hours of lecture and three hours of laboratory work per week for three credits (2c-3l-3cr). The new course will have three hours of lecture and three hours of laboratory work per week for four student credit hours (3c-3l-4cr). The additional hour of lecture per week reflects the overall growth of the field of oceanography since the course was originally developed and will specifically allow for the incorporation of emerging understandings about the influence oceans have on the global warming debate. In addition, the prerequisite has changed to GEOS 201/202, and course number has changed to GEOS 370.

3. JUSTIFICATION/RATIONALE

The field of oceanography is rapidly advancing field in the geosciences with many important problems of the modern age (climate change, resources, etc) influenced by processes occurring in the oceans. This course has traditionally focused on the physical processes that happen in the oceans with very little time devoted to the interactions the oceans have with other components of global change. The new course will maintain this original focus but woven throughout are examples and exercises designed to show the “big picture” of how oceans interact with other realms of geoscience (atmosphere, lithosphere, biosphere). To present this material adequately, a third lecture hour per week is necessary.

This prerequisite change reflects the creation of the new introductory Geoscience courses GEOS 201-203. The elimination of PHYS 111 and MATH 121 as prerequisites reflects the fact that the essential components of these courses will be taught in GEOS 202 Quantitative Methods in the

Geosciences. The change in course number is proposed to be consistent with the Geoscience Department's new course numbering system.

4. OLD SYLLABUS OF RECORD

There is no available syllabus of record for this course. We propose that the syllabus shown above be considered as the syllabus of record for this course.

Part III. Letters of Support or Acknowledgment

No other departments or programs are affected by these revisions.