LSC Use Only:
Number: _____
Submission Date: _____
Action Date: _____

UWUCC Use Only: 02-7
Number: ~~01-44~~ ~~00-57~~
Submission Date: _____
Action Date: _____

Withdrawn 11/14/03

CURRICULUM PROPOSAL COVER SHEET

University-Wide Undergraduate Curriculum Committee

I. CONTACT

Contact Person ~~Keith Putirka~~ Steve Hovan Phone x5627
Department Geoscience

II. PROPOSAL TYPE (Check All Appropriate Lines)

X COURSE Meteorology I
Suggested 20 character title

_____ New Course* _____
Course Number and Full Title

X Course Revision GEOS 371, Meteorology I
Course Number and Full Title

_____ Liberal Studies Approval for new or existing course _____
Course Number and Full Title

_____ Course Deletion _____
Course Number and Full Title

_____ Number and/or Title Change _____
Old Number and/or Full Old Title

_____
New Number and/or Full New Title

_____ Course or Catalog Description Change _____
Course Number and Full Title

_____ PROGRAM: _____ Major _____ Minor _Track

_____ New Program* _____
Program Name

_____ Program Revision _____
Program Name

_____ Program Deletion* _____
Program Name

_____ Title Change _____
Old Program Name

_____
New Program Name

III. Approvals (signatures and date)

D Richard
Department Curriculum Committee

D Richard 12-14-00
Department Chair

College Curriculum Committee

John D. Eck
College Dean

_____
Director of Liberal Studies (where applicable)

_____
*Provost (where applicable)

Part II

1. Description of the Curriculum Change

A. Catalog Description

GEOS 371 Meteorology I

2 lecture hours
3 lab hours
2 credits
(2c-3l-2sh)

Prerequisites: GEOS 121 and PHYS 111

An introduction to the meteorological sciences and climate. Topics include variations in temperature and precipitation, storms, the ice ages and the causes and potential impacts of global warming.

B. Course Objectives

1. Students will understand the fundamentals of air pressure, atmospheric adiabats, the movement of air masses and the generation of severe storms.

2. Students will understand the impact of ocean-atmosphere circulation air temperatures and precipitation patterns.

3. Students will understand the role of geological methods for determining climatological changes.

4. Students will examine the history of the ice ages, and the potential implications of recent global warming.

C. Course Outline

1. Introduction to course (5 hours)
   The origin of the atmosphere
   Structure and composition of the atmosphere

2. Heat and Energy (5 hours)
   Energy: heat and radiation balance
   Energy: heat and radiation balance
   reflection/absorption - albedo

3. Temperature - daily temperatures (4 hours)
   seasonal/global variation

4. Atmospheric Moisture (4 hours)
   %RH, dew pt., etc
   Condensation: dew, fog, & clouds

5. Stability in the atmosphere (5 hours)
   Precipitation: Bergerron processes et al.
   Precipitation problems (flash flooding)

Midterm Exam (1 hour)

6. Atmospheric Pressure (4 hours)
   Atmospheric convection

7. Global Circulation - large scale winds (5 hours)
   Local Winds
   Lab - Finish lecture topics about winds/global circulation
   El Nino and climatic interactions
   Air masses, fronts and mid-latitude cyclones

8. Severe Weather: T-storms, Lightning (4 hours)
   Severe Weather: Tornadoes

9. Climate change - causes, effects, interactions (5 hours)
   Paleoclimatology: Records of climate change
   Ice-Ages
   Long term climate changes

D. Evaluation Methods

The final grade for this course will be determined as follows:

Midterm Exam	25%
Final Exam	30%
Research Project	35%
Presentations	10%

Research paper and presentation:

Students will prepare a brief oral presentation (12-15 minutes) on three different topics relevant to meteorology. In addition, students will select one of these topics to develop into a written term project consisting of 6-10 typed pages or a web-based presentation. In either case, students will be provided with the necessary background and training to make a professional presentation. Students will also have a chance to revise papers/websites after peer and professor reviews.
Grading Scale: A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; F = 0-59%.

E. Required Textbooks, Supplemental Books and Readings

Text:
Lutgens, and Tarbuk, *The atmosphere,8th ed*, Prentice Hall, Upper Saddle, NJ, 484p, 2001.

F. Special Resource Requirements

None.

G. Bibliography

Critchfield, H.J., General Climatology., Prentice Hall, Englewood Cliffs, NJ. 1985.
DeFelice, T., Meteorological Instrumentation and Measurements, Prentice Hall, Upper Saddle River, NJ. 226p, 1998.
Emanuel, K.A. *Atmospheric Convection*, New York, Oxford University Press, 1994.
Flohn, H., 1981. A hemispheric circulation asymmetry during late Tertiary. *Geol. Rundsch., 70*: 725-736.
Fujita, T. T., *The Downburst – Microbursts and Macrobursts*, University of Chicago Press, , Chicago, 1985.
Kiehl, Jr. and K.E. Trenberth, *Bulletin of the American Meteorological Society, 78*, p 197-208, 1997.

Neese, et al., A world of weather – fundamentals of meteorology, Kendall-Hunt Publishing Co, Dubuque, Iowa, 515p. 1999.
Oort, A. H., Global atmospheric circulation statistics, 1958-1973. *NOAA Prof. Pap., 14*, 115-173, 1983.
Savin, S. M., The history of the Earth's surface temperature during the past 100 million years, *Ann. Rev. Earth Planet. Sci., 5*, 319-355, 1977.
Shackleton, N. J., and J. P. Kennett, Paleotemperature history of the Cenozoic and the initiation of Antarctic glaciation: Oxygen and carbon isotope analyses in DSDP Sites 277, 279, and 281, in Kennett, J. P., Houtz, R. E., et al., *Init. Repts .DSDP 29,* U.S. Government Printing Office, Washington, D. C., 743-755, 1975.
Wyrtki, K., 1974. Equatorial currents in the Pacific, 1950-1970, and their relation to Trade Winds. *J. Phys. Oceanogr., 4*: 372-380.

2. Summary of Proposed Revisions

A. Comparison of Catalog Descriptions

GEOS 371 Meteorology I — 2 lecture hours, 3 lab hours, 2 credits, (2c-3l-2sh)

Prerequisites: One year of physical science or physics

An introduction to the meteorological sciences; composition and structure of the atmosphere, radiation principles; elementary thermodynamics and heat balance.

Proposed Catalog Description:

GEOS 371 Meteorology I — 2 lecture hours, 3 lab hours, 2 credits, (2c-3l-2sh)

Prerequisites: GEOS 121 and PHYS 111

An introduction to the meteorological sciences and climate. Topics include variations in temperature and precipitation, storms, the ice ages and the causes and potential impacts of global warming.

B. Summary of revisions

The prerequisites and course catalog description are changed.

3. Justification for Revision:

No syllabus of record exists for this course, and so the present course syllabus is offered as a syllabus of record. The prerequisites are changed as no course titled "physical science" exists, and because PHYS 111 and GEOS 121 provide adequate background for this course.

4. Old Syllabus of record

Does not exist

"Old" Syllabus

Course Syllabus: GS 371- Meteorology - Fall '98

Lecture: MW 1:00 - 2:00 / Lab: Wed 6-9pm
Room 133 Weyandt Hall
Text: The Atmosphere (7'th ed.) by Lutgens & Tarbuck
plus Lab coursepack available at Pro-Packet

Dr. Steve Hovan
office: 206 Walsh
phone: 357-7662
email: hovan@grove.iup.edu
website: www.iup.edu/gs

Office Hours: Mon (10:15-11:30), Wed (10:15-11:30), Fri (10:15-11:30), and by appointment.

Attendance & Participation

You are expected to attend all classes. If you cannot attend, it is your responsibility to obtain lecture/lab materials and assignments. In addition to attendance, active participation in class discussions through questions and expression of ideas formulated while reading assigned text material is strongly encouraged. If you have outstanding attendance and participation during the semester, I will add 2 percentage points to your final total grade (e.g. 88% --> 90%, 78% --> 80%, etc.).

Exams:

There will be two exams for this class - a midterm and a final. Both exams will consist of essay questions covering material from both the lecture and laboratory portions of the class. A makeup exam will be given only when verifiable emergency circumstances exist. Exams are designed in such a manner as to test your conceptual understanding of the material presented and it's significance to the overall Earth system.

Research paper and presentation:

A research project will consist of several "pieces" that will ultimately result in the creation of an informative (and entertaining?) webpage concerning some aspect of meteorology or weather. This project is designed to help you learn how to use the www as another potential tool for teaching and to learn more about some aspect of oceanography in greater depth than is covered in class. This project is meant to update the traditional "research project" that many classes assign and give you a chance to apply your personal creative talents and interests to this class. It will involve three main components: 1) creation of your very own personal website on IUP's VAX system 2) a design "flowchart" of your research project website 3) a text-based written version of the information and 4) the completed website. This project is intended to help you learn how to summarize and present information in a clear and concise manner.

Grades:

Your minimum total grade for this class will be determined by averaging the midterm exam, final exam and final project grades.

- Midterm Exam 30%
- Final Exam 40%
- Research Project 30%

5

I'll meet with each of you individually near the midterm to discuss your status in the class. Of course, please drop by anytime throughout the semester if you have any questions about your grade or any other concern regarding the class.

ANTICIPATED LECTURE SCHEDULE:

Date		Topic	Reading
Sept	1	Introduction to course & the origin of the atmosphere	Chapter 1
	2	Structure and composition of the atmosphere	
		Lab #1: Geography/Atmospheric Composition	
	7	NO CLASS - Labor Day	
	9	Heat and Energy	Chapter 2
		Lab #2: Energy in the Earth-Atmosphere System	
	14	Energy: heat and radiation balance	
	16	reflection/absorption - albedo	
		Lab#3: Ozone Depletion	
	21	Temperature - daily temperatures	Chapter 3
	23	- seasonal/global variation	
		Lab #4: computers and websites	
	28	Atmospheric Moisture: %RH, dew pt., etc.	Chapter 4, 5
	30	Condensation: dew, fog, & clouds	
		Lab #5: Temperature and Humidity (I&II)	
Oct	5	Stability in the atmosphere	
	7	Precipitation: Bergerron processes et al.	
		Lab #6: Clouds and Storms	
	12	Precipitation problems (flash flooding)	
	14	review session	
		Midterm Lecture Exam - during lab (material through Oct. 12)	
	19	Atmospheric Pressure	Chapter 6
	21	Pressure Gradient Forces, Coriolis, Geostrophic Winds	
		Lab: Meet the Prof. (individual appointments)	
	26	GSA: out-of-town	
	28	GSA: out-of-town	
		No Lab: work on your research projects!	
Nov	2	Fronts and mid-latitude cyclones	Chapter 8, 9

	4	Severe Weather: T-storms, Lightning and Tornadoes Lab #7: Air Masses and fronts	Chapter 10
	9	Global Circulation - large scale winds	Chapter 7
	11	El Nino and climatic interactions Lab #8: Global Circulation	
	16	Global Warming I	Chapter 13, 14
	18	Global Warming II Lab #8: Winter Weather	
	23	Discussion about global change	
	25	NO CLASS - Thanksgiving NO LAB	
	30	Climate change - causes, effects, interactions	
Dec	2	Paleoclimatology: Records of climate change Lab #9: Paleoclimatology	
	7	Ice-Ages	
	9	Long term climate changes Lab #10: Climate of Pennsylvania	
		FINAL EXAM - Monday, December 14: 12:30-2:30 pm	