

08-7ii

LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
		09-43ii	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)

New Course                       Course Prefix Change                       Course Deletion

Course Revision                       Course Number and/or Title Change                       Catalog Description Change

GEOS 371 Meteorology I	GEOS 371 Meteorology
<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

This course is also proposed as a Liberal Studies Course.                       Other: (e.g., Women's Studies, Pan-African)

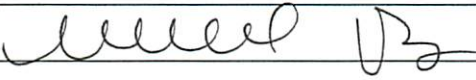
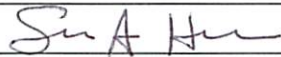


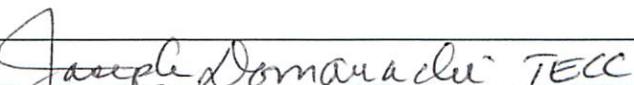
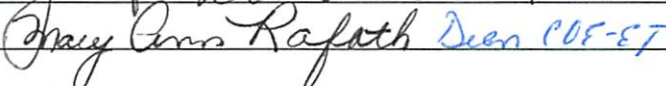
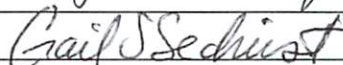
This course is also proposed as an Honors College Course.

3. Program Proposals

New Degree Program                       Program Title Change                       Other

New Minor Program                       New Track                       Catalog Description Change                       Program Revision

<i>Current program name</i>	<i>Proposed program name, if changing</i>
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4. Approvals	Date
Department Curriculum Committee Chair(s)	 2/4/08
Department Chair(s)	 2/4/08
College Curriculum Committee Chair	 2-11-08
College Dean	 2-11-08
Director of Liberal Studies *	
Director of Honors College *	
Provost *	
Additional signatures as appropriate: (include title)	 1-26-09
	 1-26-09
UWUCC Co-Chairs	 1-29-09

\* where applicable

Received

SEP 25 2008

Received

FEB 14 2008

## Part II. Description of Curricular Change

### 1. SYLLABUS OF RECORD

#### I. Catalog Description

##### GEOS 371 Meteorology

2c-3l-3cr

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

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

#### II. Course Objectives

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

- 1) Discuss the composition and origin of the Earth's atmosphere.
- 2) Summarize interactions between the atmosphere and the hydrosphere, the lithosphere and the biosphere.
- 3) Collect and synthesize data to understand factors that contribute to weather and climate changes.
- 4) Evaluate past climate changes and the influence humans have on the climate system using published scientific data.

#### 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	1	<b>Lec Exam#1*</b> , Lec Final Exam, Lab Exam#1 and Lab Exercises
1	1a, 1b	2	Lec Exam #1, Lec Exam#2, Lec. Final Exam, Lab Exam#1, Final Lab Exam.
1	1b, 1c, 2b, 3a	3	Lec Exam#2, Lec Final Exam, Lab Exams and Lab Exercises
1	1c, 3a, 4a	4	Lec Exam#2, Lec Final Exam, Lab Final Exam, Lab Exercises, and <b>Research Project and Presentation*</b>

#### III. Course Outline

##### Lecture

##### 1. Introduction to course (3 academic hours)

The origin of the atmosphere

Structure and composition of the atmosphere

2. Heat and Energy (3 academic hours)  
Energy: heat and radiation balance  
Energy: heat and radiation balance  
reflection/absorption - albedo
  3. Temperature - daily temperatures (3 academic hours)  
seasonal/global variation
  4. Atmospheric Moisture (2 academic hours)  
%RH, dew pt., etc.  
Condensation: dew, fog, & clouds
- Lecture Exam #1 (1 academic hour)
5. Stability in the atmosphere (3 academic hours)  
Precipitation: Bergerron processes et al.  
Precipitation problems (flash flooding)
  6. Atmospheric Pressure (2 academic hours)  
Atmospheric convection
  7. Global Circulation - large scale winds (3 academic hours)  
Local Winds  
El Nino and climatic interactions  
Air masses, fronts and mid-latitude cyclones
- Lecture Exam #2 (1 academic hour)
8. Severe Weather: T-storms, Lightning (2 academic hours)  
Severe Weather: Tornadoes
  9. Climate change - causes, effects, interactions (5 academic hours)  
Paleoclimatology: Records of climate change  
Ice-Ages  
Long term climate changes
- TOTAL = 28 ACADEMIC HOURS

Final exam during final exam period

**Laboratory Exercises (3 academic hours each)**

- |          |                                       |
|----------|---------------------------------------|
| Week 1:  | Geography/atmosphere composition      |
| Week 2:  | Energy in the Earth-atmosphere system |
| Week 3:  | Ozone depletion                       |
| Week 4:  | Tools of the Meteorologist            |
| Week 5:  | Temperature and humidity              |
| Week 6:  | Clouds and storms                     |
| Week 7:  | Lab Midterm Exam                      |
| Week 8:  | Air masses and fronts                 |
| Week 9:  | The mid-latitude cyclone              |
| Week 10: | Global Circulation                    |
| Week 11: | Winter weather                        |
| Week 12: | Paleoclimatology                      |
| Week 13: | Climate of Pennsylvania               |
| Week 14: | Lab Final Exam                        |

**IV. Evaluation Methods**

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

Lecture Exam 1	15%
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Lecture Exam 2	15%
Lecture Final Exam	25%
Laboratory Exercises	10%
Laboratory Midterm Exam	10%
Laboratory Final Exam	10%
Research Project & Presentation	<u>15%</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

Grenci, L. and Nese, J. *A World of Weather – Fundamentals of Meteorology*. Dubuque, Iowa: Kendall-Hunt Publishing Co, 2006.

#### 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.

Critchfield, H.J., (1985) *General Climatology.*, Prentice Hall, Englewood Cliffs, NJ.

DeFelice, T., (1998) *Meteorological Instrumentation and Measurements*, Prentice Hall, Upper Saddle River, NJ. 226p.

Drake, F., (2000) *Global Warming – The Science of Climate Change*, Oxford University Press, New York, NY.

Emanuel, K.A. (1994) *Atmospheric Convection*, Oxford University Press, New York, NY.

Fujita, T. T., (1985) *The Downburst – Microbursts and Macrobusts*, University of Chicago Press, Chicago.

Grenci, L. and Nese, (2006) J., *A World of Weather – Fundamentals of Meteorology*, Kendall-Hunt Publishing Co, Dubuque, Iowa, 780p.

Kiehl, Jr. and K.E. Trenberth, (1997) *Bulletin of the American Meteorological Society*, 78, p 197-208.

Philander, G. (1998) *Is the Temperature Rising?*, Princeton University Press, Princeton, N.J., 262p.

Easton, T. (Ed), (2005) *Taking Sides – Clashing Views on Environmental Issues*, McGraw-Hill/Dushkin, Dubuque, IA, 359p.

#### 2. SUMMARY OF PROPOSED REVISIONS

The course content was updated to reflect a greater emphasis of content involving global climate change. Course pre-requisites were modified so students would have necessary background for successful completion of this course.

#### 3. JUSTIFICATION/RATIONALE

The field of meteorology encompasses a wide variety of atmospheric science including heat and energy in the atmosphere, weather measurement and prediction, and global climate change. In

previous years, more emphasis was placed on measuring/predicting weather. In the revised course, students will be exposed to this content but more emphasis will be placed on the global pattern of weather and longer-term climatic changes.

#### **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.