PHY 171 Intro to Meteorology
Fall 2009

Instructor: Dr. Nathan Magee
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Office hours: Tuesday and Friday after lab, 4-5 pm, Thursday 11 am-12 pm, and by appointment (**in SCP 125**)
Required Text: *A World of Weather Fundamentals of Meteorology, 4th ed. by Grenci and Nese (ISBN 0757521126)*
Additional required reading**:** *The Cloudspotter's Guide: The Science History, and Culture of Clouds (ISBN 0399533451)*

Course web site: www.tcnj.edu/~magee

Meeting Time/Space:	lecture, Tuesday and Friday	12:30-1:50 pm	SCP 117
	lab, Tues.(sect. 01), Fri.(sect. 02)	2:00-3:50 pm	SCP 122
	SCP-117 (lecture), 122 (lab)		

DESCRIPTION

The first portion of the course explores fundamental topics in atmospheric science including: scale analysis of the atmosphere, behavior of ideal gases, pressure and wind, solar radiation and seasons, buoyancy and stability, cloud and precipitation formation. When appropriate real-time weather senarios are discussed and analyzed with an eye toward creating savvy consumers of quality information about the weather. The second part of the course is devoted to two case studies: 1) weather forecasting methods and models; 2) the evidence, models, and prediction of global warming. Labs include weather forecasting, construction of observation instruments, and analysis of maps and remote sensing imagery.

COURSE STRUCTURE

Assignments: Readings, Problem Sets, and issue analysis projects
Reading will be assigned to be completed prior to each class. Comprehension of this reading will be necessary to actively participate in class.

Problem sets will be assigned approximately bi-weekly and will consist of questions and problems drawn from the text as well as other sources. We will reserve some time during class to work on problem-solving, but much of the work will need to be completed outside of class. The problem sets are an essential tool for learning and should be done carefully. Late submissions will not be accepted. Grading of problem sets will be discussed in class.

You will be asked to conduct two small scale projects during the semester where you will examine current topics in atmospheric science in more detail by reading and analyzing a scientific journal article. The details of these projects will be discussed in class.

Exams: 2 major exams and a comprehensive final exam.
Two exams will be held during the semester and a comprehensive final exam will conclude the course. Each exam will require understanding of lecture material, assigned problems, and lab exercises.

Labs:
One lab will be held each week. A tentative calendar for our course will be available on the course web site. These labs will require teamwork, hands-on problem solving, and some writing, and will be an important part of your course grade.

Classroom lectures and discussions:
The classroom time will be devoted to lectures, discussions, and problem solving which follow text material. Please do not hesitate to ask questions during class. Your presence and active participation in the classroom is important for developing a positive learning experience for all students in the course. Your classroom participation does contribute to your course grade (see below) and will be evaluated based on your involvement in class discussions and your contribution to group exercises in the lab.

Grading Weights:
55% midterm exams and final (exam 1: 15%; exam 2: 15%; final exam: 25%)
20% problem sets and issue analysis projects
20% laboratory grade
5% classroom participation

Course Grades:
Exams and course grades will not be curved. Grades will be given according to the following percent scale, where final grades are rounded to the nearest whole percent:

93-100	A
90-92	A-
88-89	B+
83-87	B
80-82	B-
78-79	C+
73-77	C
70-72	C-
60-69	D
below 60	F

School Closings:
If class should be canceled for any reason, any scheduled exams or due problem sets will be transferred to the first day we return to class.

Tentative Schedule (refer to online schedule for updated details)

Part I: The fundamentals of Atmospheric Science

Week 1:	Scales and analyses of atmospheric structures and phenomena
Week 2:	Solar radiation and energy balance; the seasons and earth's orbit
Week 3:	Temperature and atmospheric thermodynamics
Week 4:	Moisture and humidity and cloud formation
Week 5:	Remote sensing: a focus on satellite and radar
Week 6:	Horizontal patterns and winds
Week 7:	Vertical structure, stability, and convection
Week 8:	Thunderstorm structures
Week 9:	Tropical meteorology and Hurricanes

Part II: Case studies in Meteorology and Climate

Week 10-11:	Forecasting: models and the structure of the U.S. forecasting market
Week 12-14:	Global warming: evidence, models, predictions and economics.

Labs:

- Orbital motion and the horizontal sundial
- Isopleth and METAR interpretation
- Interpretation of satellite imagery
- Interpreting radar imagery and radar-based precipitation
- Psychrometer construction and moisture measurement
- Forecasting Severe Storms/Hurricanes
- Making a rain gauge & precipitation measurement analysis
- Acid Rain and urban pollutants
- Local Forecasting Contest
- Viewing and discussion of popular media: Hurricane Katrina
- Viewing and discussion of popular media: Global Warming