

MET 3003 GENERAL METEOROLOGY (REF #15175)

FLORIDA INTERNATIONAL UNIVERSITY

Spring 2007

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Time and location: Monday & Wednesday, 11:00AM-12:15PM, GL-137

Office Hours: MW 1:00-2:00 PM, TU 9:00-10:00 AM, or by appointment.

Prerequisites: MAC 2311 (Calculus I) and PHY 2048 (General Physics) or permission of the instructor.

Text: *The Atmosphere, An Introduction to Meteorology*, by Frederick K. Lutgens and Edward J. Tarbuck, 10th Edition, 2006, ISBN-0131874624. Supplementary class notes. You can reach an on-line version of this syllabus at:

http://www.fiu.edu/~willough/met_3003/0_Syllabus.htm

And a pdf version at:

http://www.fiu.edu/~willough/met_3003/0_Syllabus.pdf

Course description: A quantitative introduction to the Earth's atmosphere. Topics include: tropical and midlatitude weather, clouds and convection, solar and infrared radiation, general circulation and climate, and a bit of meteorological dynamics.

Course Goals and Objectives: This course is the first in a series designed to constitute an Atmospheric Science Track within FIU Department of Earth Sciences. It provides an introduction to the profession of meteorology and a description of the atmosphere for undergraduate students majoring in physical sciences or engineering. We will answer questions such as these:

- What do meteorologists do and how do other professions relate to meteorology?
- What are the history, composition, and broad-scale structure of the atmosphere?
- What are the roles of heat and moisture in the atmosphere?
- What determines the strength and direction of the wind?
- What determines the structure and behavior of middle-latitude and tropical weather systems?
- How do clouds, rain, snow, and hail form?
- How and why does the climate change?

Course organization and philosophy: I hope and expect that you are self-selected for motivation and interest in the atmosphere. This is a reasonably demanding course, but the class is small enough for substantial interaction and individual attention. Make a genuine effort, and you should do well.

Although *Lutgens & Tarbuck* is a newly-revised, widely-used text for first courses in meteorology, it is more elementary than the level on which I will teach. I'll provide supplemental notes on more quantitative topics. This book is easy to understand. Please

read the assignments before we cover them in class, and bring the book each time we meet because we will refer to some of the figures. I welcome thoughtful questions. The book has a companion website with key concepts and practice tests:

http://wps.prenhall.com/esm_lutgens_atmosphere_10

This material can be a valuable add-on to what we do in class. I may draw a few test questions from the study materials on this site.

I see meteorology as a descriptive natural science that often speaks the language of physics and mathematics. You need to learn some basic mathematical ideas here, but we will be selective and focus on essential concepts. Attending the lectures, doing the reading, participating in discussion, and taking careful notes will be keys to success in MET 3003.

Homework	20%
Exam #1	20%
Exam #2	20%
Final Exam	40%
Total	100%

We will have occasional homework, particularly while we're studying Chapters 1-4. A focused effort and understanding of the material should be enough to complete the homework successfully. I encourage you to work together, but don't copy. There will also be two exams and a final. Format of the exams will be multiple choice, fill in

the blank, short (1-2 paragraph) essay, draw and label a sketch, and problems like ones you will have seen in the homework.

Homework and exams will contribute to grades as indicated in the table above on the left, and I plan to use a standard 90-80... scale, as shown to the right, for assigning letter grades.

Grading Scale	
100-90	A
89-80	B
79-70	C
69-60	D
below 60	F

A word about intellectual dishonesty, which I define as claiming someone else's work or ideas as your own. I won't tolerate it, and it is a certain way to have a bad outcome in MET 3003. Everyone is trustworthy unless proven otherwise.

Daily Weather: We will use the Internet connection in our classroom and local observations to discuss interesting weather during the first few minutes of each class. Three informative web sites are:

The Marshall Spaceflight Center's GOES Satellite viewer:

<http://weather.msfc.nasa.gov/GOES/>

The Miami Weather Service Radar:

<http://radar.weather.gov/ridge/radar.php?rid=AMX>

And the NCEP web-based surface weather analysis:

<http://www.hpc.ncep.noaa.gov/html/sfc2.shtml>

On your way to class each day, please notice the clouds, temperature, humidity, and wind. This time of year the fronts pushing south from the snowy north can be spectacular, and by spring we'll be able to watch some good sea-breeze convection over Florida. I will arrange a class tour of the National Hurricane Center and Weather Forecast Office, probably in March.

MET 3003 TOPICS AND READING ASSIGNMENTS

Class	Month	Date	Lecture	Topic	Reading
1	JAN	8	1	Meteorology	Ch. 1
2		10	2	The Atmosphere	
		15		MLK day, no class	
3		17	3	Classical gasses*	
4		22	4	Heat in the Atmosphere	Ch. 2
5		24	5	Heat and Energy*	
6		29	6	Air Temperature	Ch. 3
7		31	7	Moisture and Humidity*	Ch. 4
8	FEB	5	8	Stability	
9		7		Exam #1	Ch. 1-4
10		12	9	Clouds	Ch. 5
11		14	10	Hydrometeors	
12		19	11	Pressure*	Ch. 6
13		21	12	Winds*	
14		26	13	Atmospheric circulations	Ch. 7
15		28	14	Air Masses	Ch. 8
16	MAR	5	15	Weather Patterns	Ch. 9
17		7	16	Thunderstorms & tornadoes	Ch. 10
18		12	17	Weather Summary	Ch. 5-10
19		14		Exam #2	Ch. 5-10
		19-24		Spring break, no class	
20		26	18	Hurricanes	Ch. 11
21		28	19	Weather Forecasting	Ch. 12
22	APR	2	20	Pollution	Ch. 13
23		4	21	World Climates	Ch. 15
24		9	22	Climate change	Ch. 14
25		11	23	Climate, continued	
26		16	24	Atmospheric optics	Ch. 16
27		18	25	Review	ALL
		TBA		FINAL EXAM	Cumulative