ATMO 580 Tropical Meteorology Fall 2011

Instructor: Prof. Liz Ritchie Office: 570 PAS Building
Phone: 626-7843 Email: ritchie@atmo.arizona.edu

Class Meetings: Monday, Wednesday, Friday 1:00 pm-1:50 pm PAS 488

Office Hours: Tues/Wed 11:00 am - 12:00 pm, or by appointment.

Course Website:
http://www.atmo.arizona.edu/students/courselinks/fall11/atmo580/atmo580.htm or follow the link through the ATMO page courselinks to **ATMO580.** All students need to be able to access this website. **If you do not have a U of A email account, you must obtain one immediately.**

Overview:

The tropics cover approximately half of the Earth, and at least two third of the global population live equatorward of 30 degrees latitude. The laws of physics and the equations and concepts that we use in meteorology do not change with latitude, but the weather in the tropics is significantly different from weather in the midlatitude and polar regions. Life tends to be somewhat different in the tropics as well. It isn't possible to understand weather fully without considering the atmosphere globally, and this course is intended to provide an overview of both tropical weather and how the entire global atmosphere works. Particular emphasis will be placed on tropical cyclones, which are the most destructive of all individual weather phenomena.

The course meets three times a week. The normal procedure will be to have lectures on all three days. However, as the term progresses, the Friday session will be used for presentations and other activities.

Textbook:

Alas, there is no specific text. No one has ever written a book on tropical meteorology that is suitable as a modern textbook. There will be papers to download from the website to accompany the lectures.

About 25% of the material will be taken from:

McGregor, G. R., and S. Nieuwolt, 1998: Tropical Climatology, 2nd Ed., Wiley Publishers. A copy is in the ATMO library and can be checked out on a short-term basis.

For a general reference on the basic dynamics of the tropical atmosphere, refer to chapters 10 and 11 of Holton's "An Introduction to Dynamic Meteorology", 3rd/4th editions. You should all have a copy of that book by now. There is also a copy available in the Atmospheric Sciences library.

For a general reference on atmospheric physics, refer to Wallace, J. M., and P. V. Hobbs, Atmospheric Science – an introductory survey, 1st/2nd editions.

Grading:

There will be two midterm exams (30%) and a final exam (20%). Homework problems will be assigned in class on an *ad hoc* basis and comprise 10%. Weekly student-lead "state of the tropics" discussions and class participation will comprise 15%. The final 25% will be based on a research project, consisting of a written report and oral presentation to the class during the last half of the term. The written report will be due the week after the oral presentation is given.

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Section 1 – Introduction, Climatology, and the Tropical General Circulation
August 22 – September 23

Topics: Introduction to Tropical Weather
Basic Laws of Weather and Climate
Radiation in the Low Latitudes
Tropical Climatology
General Circulation of the Tropics
Tropical Dynamics

Special Dates: **September 5** **Labor Day – No Class**
September 23 **Midterm Exam 1**

Section 2 - Large-scale Tropical Phenomena
September 26 – October 28

Topics: Tropical Dynamics and Vertical Structure
Non-seasonal Variations of the Tropical Circulation
Monsoons
Tropical Disturbances (except tropical cyclones)

Special Dates: **October 21** **Midterm Exam 2**

Section 3 - Tropical Cyclones and Tropical Precipitation
October 31 – December 7

Topics: Tropical Cyclone mature structure
Tropical Cyclone dynamics
Tropical cyclone genesis
Tropical Cyclone lifecycle/motion/landfall/impacts
Tropical cyclones and climate

Special Dates: **November 11 Veteran's Day – No Class**
November 18 Student Presentations
November 23 Student Presentations
November 24-25 THANKSGIVING RECESS
December 2 Student Presentations
December 7 Student Presentations

December 12 ***** FINAL EXAM *** 10:30 am - 12:30 pm**