

A&OS 101
Atmospheric Dynamics and Thermodynamics
Fall, 2008

Instructor: Prof. Robert Fovell

Office: 7162 Math Sciences (310-206-9956)

Office hours: Specific hours to be announced, and whenever my door is open

Home page: <http://www.atmos.ucla.edu/~fovell>

Download directory: <http://www.atmos.ucla.edu/~fovell/AOS101/downloads/>

Email: rfovell@ucla.edu (Backup email: parody805@gmail.com)

AIM: “parody@mac.com” (without the quotes)

Credit: 5 units.

Prerequisites: Math 3B or 31B; Physics 1B or 6B. (AOS 3 recommended but not required.)

Class meetings: MWF 11-1 (7124B Math Sciences)

Text: None required. If you wish to get a book, I recommend *Atmospheric Science: An Introductory Survey*, by J. M. Wallace and P. V. Hobbs. The 2nd edition suffices and can be had cheaply from half.com.

Overview: This course provides an introduction to the thermodynamics and dynamics of the atmosphere.

Grading: Midterm (30%), homework (30%), final (30%), participation (10%). Class attendance is expected.

General course outline:

- Introduction, atmospheric composition and structure, hydrostatic balance.

Thermodynamics.

- Ideal gas law; adiabatic, diabatic and cyclical processes.
- Adiabatic charts; moist air processes.
- Atmospheric stability.

Dynamics.

- Fundamental forces and equations of motion; scale analysis.
- Coordinate systems; continuity equation.
- Wind flows: geostrophic, gradient, inertial and cyclostrophic.
- Temperature gradients and the “thermal wind”.
- Gravity waves (buoyancy oscillations).