# Atmospheric Sciences 101 Midterm 2 Study Guide

**Pressure**

1) Why does pressure decrease with height?

2) Ideal gas law and how it relates pressure, temperature, volume and density

3) Pressure contouring (isobars/lines of constant height) in vertical & horizontal

4) Convergence and divergence at the surface and aloft, and its effect of surface pressure

5) Relation between the height of a constant pressure surface and the temperature in the column of air between the ground and that surface

**Clouds and Precipitation**

1) Why does rising air cool?

2) Why do moist and dry parcels cool at different rates as they rise?

3) What factors are important in determining cloud shape? (cumuliform vs. stratiform)

4) Cloud classification (high, middle & low clouds; stability associated with them)

5) Cloud drop formation (what is needed besides water vapor?)

6) Precipitation formation (warm vs. cold clouds)

7) What is entrainment and how does it affect cloud growth?

**Stability**

1) Environmental lapse rate

2) Stable, unstable, conditionally unstable environments

3) Moist vs. dry adiabatic lapse rates (how dry vs. moist parcels cool with ascent)

**Winds**

1) Newton's laws of motion (force balances)

2) What forces balance an air parcel vertically?

3) Forces influencing horizontal winds:

   i. Coriolis force

   ii. geostrophic wind

   iii. friction

4) Winds in relation to contours of the pressure field and in relation to high & low pressure systems