EAS 171
Astronomy and Meteorology
Objective Sheet: Atmospheric Composition and Temperature

Vocabulary:

weather | equinox | meteorology
pressure | Tropic of Capricorn | climate
temperature | diffused daylight | thermal stratification
inclination | lapse rate | circle of illumination
tropopause | one atmosphere | daily mean
stratosphere | growing degree day | stratopause
conduction | heating degree day | mesosphere
radiation | troposphere | daily range
Antarctic Circle | mesopause | convection
greenhouse effect | thermosphere | langley's/minute
specific heat | homosphere | albedo
isotherms | heterosphere | insolation
wind | ozonosphere | terrestrial radiation
currents | ionosphere | radiative balance
exosphere | noon sun angle | dust
Tropic of Cancer | water vapor | solstice

Objectives:

1. Define the science of meteorology, and explain why meteorology is considered a combination of physics and geography.

2. Illustrate the thermal layers of the atmosphere, and show the general trends of the lapse rate.

3. List the three major components of the atmosphere and their respective subdivisions, and determine their meteorological importance.

4. State precisely the concepts of the gas laws in accordance with the relationships between the physical properties of pressure, temperature, density, and volume.

5. Discuss the effectiveness of the three mechanisms of heat transfer in warming the atmosphere and in distributing thermal energy within the atmosphere.

6. State the relationship between the inclination of the solar radiation and the resultant temperatures according to latitude.

7. Contrast the specific heat of land with water, and discuss the differences in heating and cooling of land and water and the resultant differences in air density and atmospheric pressure.
8. State the relationship between the thermal layers of the atmosphere and stability.

9. Given the necessary data, be able to calculate the noon sun angle.

10. Explain the changing of the seasons and the variations of the length of night and day as a result of the obliquity of the ecliptic. (Use such terms as noon sun angle, solstice, equinox, Tropic of Cancer, etc.)

11. Illustrate the Earth's energy budget.

12. Discuss the importance of latitude, differential heating of land and water, ocean currents, altitude, and geographic position in the determination of air temperature.