ATM 110 MIDTERM REVIEW

The purpose of this review sheet is to help you focus on some of the more important material covered since the beginning of the quarter. It is important to keep in mind, however, that this review sheet it is <u>not</u> meant to cover everything of importance.

Note: Equations/formulae will be provided if needed, but you need to know which equation is for what purpose. **Bring your calculator.**

Forecasting problems; relationship among horizontal, vertical, and temporal scales of weather phenomena.

Observations: In Situ versus remotely sensed.

In Situ: Surface data (NWS, METARS) versus soundings (Radiosondes)
Locations and temporal and spatial resolutions of observations
Information (variables) reported
Station models

Remotely sensed: Active vs. passive
RADAR: reflectivity, radial velocity, particle identification, refractivity, how to interpret data.
Satellite: geostationary vs. polar orbiting.
Orbital characteristics, temporal and spatial resolutions, etc.
Applications of data.

Numerical modeling and data assimilation; mesoscale model vs. global model
Analysis:
Forces: pressure gradient, Coriolis, Centrifugal and frictional forces
Balance flow: geostrophic, gradient, cyclostrophic approx. etc.
Thickness, Pressure and height estimation with different assumption of T, etc.-hypsometric equation
Sounding: Skew-T log-P diagrams
Horizontal: different levels of weather analysis, calculation of different forcing terms (PGF)
Moisture and temperature variables
Parcel Theory: definitions, importance and methods of finding the LCL, LFC, EL, CCL, MCL, and potential instability
Three lapse rates
Vertical stability (absolutely stable, conditional unstable, absolutely unstable etc.), static stability, and Richardson number
Stability indices: CAPE, LI, K index, TT, SWEAT: concepts and application.
Inversion types and major characteristics
Nature coordinates
Processes affect vertical stability

Fronts and dryline: Warm, cloud, occluded, and stationary fronts, their definitions and characteristics.
Cyclones (initial, mature, and decaying stages): draw a cyclone and its associated fronts, wind, etc.
Cloud and precipitation common at each frontal type
Weather analysis and forecasting