

# **Meteorology 301 – Spring 2017**

## **Exam #2 Review Sheet**

### **Review topics**

- Characteristics of 500mb height plots.
- Surface plots and general station model as illustrated in handout.
- Characteristics of surface features.
- Characteristics and identification of Fronts.
- General characteristics and use of 850mb, 700mb, 500mb, and 300/250/200mb surfaces.
- Use of station time series for front identification.
- Tilt of systems with height.
- Radiant flux, irradiance, and monochromatic irradiance.
- Direct, diffuse, longwave (terrestrial), and shortwave (solar) radiation.
- Blackbody radiation.
- Planck's law, Wein's law, and Stefan-Boltzmann's law and their relationship to each other.
- Radiative equilibrium type problems (energy in = energy out)
- Beer's law and atmospheric absorption of radiation.
- Scattering of solar radiation.
- Significance of Rayleigh scattering for solar radiation and weather radar.
- Other scattering regimes: Geometric and Mie.
- Homogeneous nucleation.
- Kelvin's formula.
- Heterogeneous nucleation and the impact of aerosols on nucleation.
- Kohler curve analysis.
- Growth of drops by condensation processes and its relation to the formation of rain drops.
- Growth of drops by coalescence and collision and its relation to the formation of rain drops.

### **Derivations of Interest**

- Derive Wein's law from Planck's law.
- Manipulation of Kelvin's formula.