

Department of Atmospheric Sciences

COURSE ANNOUNCEMENT – SEMESTER I – 2007–2008

ATMS 403: Weather Analysis and Forecasting

Call number: 49414

Instructor: Prof. Steve Nesbitt, 203 Atmos. Sci. Bldg.

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Room and Time: 109 Atmos. Sci. Bldg.; 12:30–2:50 p.m. T R

Credit: 4 hours

Prerequisites: ATMS 300 (or equivalent) required; ATMS 401 and 402 recommended

This course provides the student with the necessary skill to conceptualize the structure and dynamics of the atmosphere through interpretation and analysis of weather charts, time and cross sections, soundings and forecast products. This course is a “hands on” course where the student develops case studies of weather system structure, participates in discussions of weather processes as depicted by weather maps, and learns techniques of forecasting weather. Extensive use of meteorological data analysis packages such as IDV and GARP will be made.

Course Content:

1. Routine Meteorological observations: Surface and upper-air observations; radar, satellite, and profiler data; depictions of these data on weather charts.
2. Contour analysis and representativeness of data: Analysis of surface and upper-level data and cross section analysis; isentropic analysis.
3. Atmospheric soundings: Thermodynamic diagrams; techniques of sounding analysis.
4. Weather system structure: Atmospheric kinematics and dynamics and their depiction on weather charts; conceptual models fronts and mid-latitude cyclones and convective weather systems; comparison of models with real storm systems.
5. Life cycle of storms of the mid-latitudes: cyclone/anticyclone climatology; structure and evolution of mid-latitude cyclones and anticyclones.
6. Forecasting: severe weather, winter weather and quantitative precipitation forecasting; operational numerical weather prediction models; interpretation of numerical guidance; Model Output Statistics (MOS); ensemble forecasting.

Text: *Mid-Latitude Atmospheric Dynamics*, by Jonathan Martin, 1st Edition, Wiley & Sons, 2006 (Required).

Weather Forecasting Red Book, by Timothy Vasquez, 1st Edition, Weather Graphics Technologies, 2006 (Required).

Severe and Hazardous Weather, by Robert Rauber, John Walsh and Donna Charlevoix, 2nd Edition, Kendall-Hunt, 2005 (Recommended).