

Course: ATM 400 Synoptic Meteorology I

Fall 2009

Class schedule: TuTh 4:15 – 5:35 p.m in ES 232 (5:00–5:35, lab in maproom)

Instructor: Nicholas Metz, ES 234, 442-4515, nmetz@atmos.albany.edu

Webpage: <http://www.atmos.albany.edu/student/nmetz/400.html>

Office hours: MW 10:00 a.m.– 12:00 p.m. (other times by appointment)

Prerequisite: ATM 311, 350

Co-requisite: ATM 410

Purpose of course: This course will examine thermodynamic and dynamic principles of multiscale weather events, with the goal of understanding connections between observational and theoretical descriptions of large-scale atmospheric motions.

Recommended textbooks: Martin, J. E. 2006, *Mid-latitude atmospheric dynamics: a first course*.**

Bluestein, H. B., 1992: *Principles of kinematics and dynamics*. Vol. I, *Synoptic–dynamic meteorology in midlatitudes*.

Holton, J. R., 2004: *An introduction to dynamic meteorology*.

Grading: Midterm Exam 20%
Final exam (Dec 15th, 1:00–3:00 p.m.): 20%
Research project: 20%
Map discussion: 15%
Quizzes: 10%
Homework/Lab Exercises: 15%

Late Policy: All assignments will be collected at the beginning of class on the assigned due date. Late work will not be accepted without a valid excuse cleared with me individually.

Forecasting requirement: Forecasts must be entered on 70% of days for both the short-term and 3–5 day Albany forecasting contests to avoid a half-letter reduction in your final grade. All students *must* forecast on map discussion days.

Lecture topics:

1. Geostrophic Approximation
2. Thermal Wind Balance
3. Jet Streak Circulations
4. Temperature Advection and the Vertical Wind Profile
5. Ageostrophic Wind
6. Thermodynamic Equation
7. Static Stability
8. Vorticity Equation
9. Potential Vorticity
10. Ekman Pumping
11. QG Theory: Vorticity, Thermodynamic, Height Tendency, and Omega Equations
12. Thermal Vorticity
13. Fronts and Deformation
14. Cold Air Damming