Course Objectives:
The primary objective of this course is to develop a comprehensive understanding of mesoscale meteorology and the dynamics governing it. In particular, the course will emphasize differences and interactions among mesoscale, synoptic and convective processes, and touch on requirements for observing, analyzing and forecasting mesoscale systems.

Texts: "Mesoscale Meteorology in Midlatitudes" by Markowski and Richardson (available in University bookstore, or at Amazon for roughly $52 new, or $39 old).
Supporting material can be found in the following and journals (which should be in the library):

Course Topics (dates estimated)
Definition of mesoscale (1/12)
Differential heating-forced mesoscale circulations (1/12-1/28)
TEAM ACTIVITY - PBL relationship to land surface characteristics
TEAM ACTIVITY - PBL impacts on wind at turbine height for wind energy
Terrain-forced mesoscale circulations (1/28-2/11)
TEAM ACTIVITY - impacts of terrain on flow
Low-level jets, Fronts (2/16-18)
Dry Lines, Gravity Waves, Bores (2/18-23)
TEAM ACTIVITY - dry line behavior
Exam 1: 2/25
Convection (3/1-3/10)
Tornadoes (3/10-3/22)
TEAM ACTIVITY - tornado behavior
Mesoscale Convective Systems (3/22-3/24)
TEAM ACTIVITY
Exam 2: 3/29
More Mesoscale Convective Systems (3/31-4/5)
Mesoscale Observing Platforms (4/5-4/7)
Mesoscale numerical modeling (4/7-4/19)
TEAM ACTIVITY
Exam 3 for 407 will be on 4/21
More mesoscale numerical modeling (4/26-4/28)
Meteor 507 Presentations (5/3)

Grading and Course Assignments:
407 students
25% Class assignments (homework exercises)
55% Three course examinations (probably Feb. 25 (20%), Mar 29 (20%), Apr. 21 (15%))
10% Team Activities
10% Question/Answer Assignment on 507 presentations

507 students
25% Class assignments (homework exercises)
35% Two course examinations (probably Feb 25 (17.5%), Mar 29 (17.5%))
35% Semester Project (individual original research)
5% Team Activities

Students who are auditing the course will not receive a grade but must participate fully in the course, including all assignments except the semester project and exam(s).

507 Semester Project and 407 Q&A Assignment:

Each 507 student (except those auditing) must complete a semester project and present the results in written form due April 25, and give a 20 minute oral presentation (15 minute talk plus 5 for questions) during the Final Exam period on May 3 from 9:45-11:45 am. This project must involve original research conducted by the student individually.

Each 407 student will be required to undertake a question and answer assignment. Based on the titles and short descriptions of the 507 projects, which will be distributed to the 407 students by April 12, students will submit one question related to the material in each planned presentation, and these will be due electronically April 22. Students will also bring the same questions in written form to the presentations on May 3, and will be required to submit answers to their questions. These will be due at the end of class on May 3. The grade will be based on the depth and originality of the questions, and to a lesser extent on the actual answers.

Regarding the 507 projects, the following checkpoints will be established to assist in timely completion of the projects:

Project Topics: All students will email to me the topic they plan to address by Thursday, January 21.

Project Proposal: This is a concise statement of the nature and importance of the topic to be addressed, along with a statement of specific research techniques to be used. A brief review of previous literature in the topic must be included for all projects (include at least 3 sources). The entire size should be roughly one page. Due date Thursday, February 11 (but feel free to discuss ideas with me well before that deadline).

Progress Report: A brief update on the progress of the project with a few preliminary results (aim for no more than 2 pages) is due Tuesday, March 8. It can be emailed to me.

Written project report: A clear and concise summary of the project, similar to a journal or conference paper, is due Monday, April 25. Please note that late or handwritten reports WILL NOT BE ACCEPTED!

Oral Presentation: During the Final Exam period (May 3), we will hold a conference with a format similar to an American Meteorological Society conference. 507 students will have about 20 minutes to present their results, with 5 minutes of that time to respond to questions. 407 students will need to closely listen to the presentations in order to answer their questions, and are encouraged to use the 5 minute question time if they need more information.

DISABILITIES: Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. All students requesting accommodations are required to meet with staff in Student Disability Resources (SDR) to establish eligibility. A Student Academic Accommodation Request (SAAR) form will be provided to eligible students. The provision of reasonable accommodations in this course will be arranged after timely delivery of the SAAR form to the instructor. Students are encouraged to deliver completed SAAR forms as early in the semester as possible. SDR, a unit in the Dean of Students Office, is located in room 1076, Student Services Building or online at www.dso.iastate.edu/dr/. Contact SDR by e-mail at disabilityresources@iastate.edu or by phone at 515-294-7220 for additional information.