Mesoscale (Forecasting) Laboratory
Meteorology 417
Spring 2016

Instructor: Bill Gallus
Office: 3025 Agronomy
Office Hours: 1:00 - 2:30 pm Wednesday
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TA: Brian Squitieri - 3018 Agronomy; email brianjs@iastate.edu
TA Office Hours: 12:30 - 2 pm Thursday

Class meetings

Lecture period T 2:10-3:15 pm, Weather Discussions MW 2:30-3:00 pm, and Thursday 2:10-2:35 pm (also possibly on some Tuesdays). Lab periods T 3:15-4:30 and Thursday 2:35-4:30.

(Many labs will be done in-class, often on Thursday, but sometimes on Tuesday or both days depending on the weather. Take-home portions will usually be due the Thursday of the following week. Lab periods also will be used for occasional forecasting "quizzes".)

Texts

Required: 417/517 Course Notes "Mesoscale Forecasting Manual" (available in University bookstore).

Web page with supplemental material: http://www.meteor.iastate.edu/classes/mt417/

You may also find your "Weather Forecasting Handbook" from 311, and the new synoptic textbook, "Midlatitude Synoptic Meteorology" by Gary Lackmann helpful.

Course Objectives

This course is designed to hone the forecasting skills developed in previous synoptic labs, and expose students to mesoscale analysis and forecasting. Although the first few classes will explore mesoscale aspects of winter storms, the majority of the course will explore convective storms and the forecasting of small-scale severe weather. After completion of this course, students should be able to explain in a physically meaningful and consistent way both the synoptic-scale and mesoscale features of any weather situation.

Syllabus

January 12, 14: Course organization; Forecasting heavy snowstorms. (pp 1-16) (Instructor Away: TA will teach)

January 19, 21: Cold-air damming and lake-effect snowstorms. (pp 17-30)

January 26, 28: CSI and internal gravity waves. (pp 31-51)

Feb. 2, 4: Verification methods; Basic thunderstorm structure, outflow boundaries, other mesoscale boundaries. (pp 52-54)

February 9, 11: Mesoscale analysis and interpretation. (pp 55-64)

February 16, 18: Mesoscale sounding and stability analysis. (pp 143-158)

February 23, 25: Wind shear analyses, hodographs, helicity, using skew-Ts to predict severe weather. (pp 143-158)

March 1, 3: Storm type: Air mass thunderstorms, multicells and supercells. (pp 99-142)
March 8: Mid-term review.

March 10: MIDTERM (material through Feb 26).

March 15, 17: Spring Break - NO CLASSES

March 22, 24: Synoptic conditions favorable for severe storms, SPC IN-CLASS LAB (pp 65-98)

March 29, 31: Mesoscale convective systems - description, diagnosis. TAKE-HOME LAB (pp 204-229)

**March 31-April 2: National Weather Association Severe Storms and Doppler Radar Conference in Des Moines (students are encouraged to attend)**

April 5: Use of weather radar for severe weather forecasting and warnings. (pp 159-177) NO CLASS April 7

April 12: Weather Radar Lab NO CLASS April 14

April 19, 21: Flash floods, persistent convective events. (pp 230-247) TA Teaches

April 26, 27, 28 Tornadogenesis dynamics and tornado forecasting, Review for Final, IN-CLASS CHASE LAB. (pp 178-203)

May 2: FINAL (2:15-4:15pm)

**Grading:**

40% class exercises
10% forecast contest, weather briefings and nowcast/forecast exercises
23% mid-term exam
27% final exam

**NOTE ABOUT 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.

**NOTE ABOUT ACADEMIC DISHONESTY:** In this course, you will be permitted to do some of the weekly lab exercises outside of class. Although I understand it can be helpful to work with others in doing the lab exercises, I caution you to be sure to do your own work. Traditionally, many students receive far worse grades on the exams in this course than on the laboratory exercises, which usually indicates that the students relied too much on others when doing the labs. If I receive lab exercises from two or more students that are basically identical, I will regard it as cheating. All cases of such academic dishonesty will be reported to the Dean of Students. In addition, if problems persist on the lab exercises, I may have to require that they be done in-class.