

MEA 444: (Mesoscale) Weather Analysis and Forecasting (II)

Spring Semester 2009

Professor: Dr. Matthew D. Parker
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Office hours: Tues. and Thurs., 1:00-2:15 PM; or, by appointment

Class meetings: Mon., 2:30–3:20 PM
Tues., Weds., Thurs., 2:30–4:20 PM
Jordan Hall 5131

Prerequisites: MEA 443 (and all of *its* prerequisites)

Required text: Mesoscale Meteorology in Midlatitudes, by P. Markowski and Y. Richardson

Class website: <http://www.meas.ncsu.edu/mdparker/courses/mea444/index.html>
links to handouts, figures and PPT presentations from class, and help on homeworks

Assistant: Matt Morin
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Office hours: Monday, 1:00–2:00 PM and Friday, 9:00-10:00 AM

Student learning outcomes: During this course and by its completion, you are expected to:

- 1) identify the mesoscale phenomena on the syllabus in both observations and model forecasts,
- 2) recall the basic governing dynamics of those phenomena, and apply them in performing defensible, physically–motivated analyses of past weather, summaries of present weather, and forecasts of future weather,
- 3) methodically attack unfamiliar problems with a full palette of senior–level mathematical skills (i.e. derivations), computer skills (i.e. acquiring and plotting relevant data), and manual map analysis skills, and
- 4) lead and participate in weather discussions that are appropriate for a working B.S. forecaster (i.e. employees of the National Weather Service, Air Force Weather Agency, etc.).

Special accommodations: You have the right to appropriate, confidential accommodations of a disability. “Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653. For more information on NC State’s policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (REG02.20.1)”

Course organization: Our general weekly schedule will include roughly 3×1 hours of lecture, roughly 1×50 minutes of in-class lab work time, and roughly 3×50 minutes of in-class forecast discussion time.

Exams: There will be three in-class exams during the semester and a comprehensive final exam. The examinations cover material from the lectures, homeworks, and related sections of the class text. The exams will emphasize understanding rather than memorization, and will include problems, simple derivations, and written interpretation. There will be no make-up exams except for documented medical emergencies.

Labs and homeworks: During weeks without examinations, there will be either an in-class lab or an assigned homework, depending upon our progress through the syllabus and the complexity of the topics we're working through. The in-class labs will involve supervised practice on fundamental concepts. Homework problems will be in greater depth and may involve some derivations. Homeworks and labs will have announced deadlines; you will be penalized 33.3% per day if you turn them in late, up until they are returned and discussed in class (at which time you receive an automatic 0).

Semester case study project: You and a small team of classmates will make use of your accumulated knowledge to perform an analysis of a mesoscale case study this semester. Your investigation will culminate in an 8 page paper and a 12-minute presentation to the class. *Late work policy:* No credit for late work (or for failing to present it to the class), except in documented medical emergencies.

Forecast discussions: On three days per week we will have oral weather discussions, much as in MEA443. We will divide the class into three teams: one for each of the three days. On "their" appointed day, each team will contribute to building a forecast by using an online discussion forum. On a rotating basis, two student representatives from the day's team will then present the forecast to the class via an oral weather discussion in the lab.

We will continue to discuss the general synoptic weather and will participate in a forecast game, but the emphasis of this semester's forecast discussions will be on situational awareness, nowcasting, and short-term forecasting of mesoscale phenomena. We will also discuss and analyze previous days' mesoscale weather events in detail. Our emphasis will be on *understanding* rather than on coming up with and verifying exact numbers.

As a forecaster, you will be graded on your participation and performance in the forecast game. As a team member, you will be graded on the quantity and quality of your participation. You are expected to contribute, and to raise thoughtful points that assist your teammates. As a briefer, you will be graded on your preparation, and your ability to respond to questions and justify the various elements of your forecasts. As an audience member, you will be graded on the quality and quantity of your participation (including attendance). The emphasis here is on physical processes, not on rote memorization of "forecasting rules", so students should be prepared to discuss the day's weather, and back up their claims, with sound science. A good briefing such as this can take several hours to prepare.

Grading criteria: 50% from your scores on three midterm exams and a final exam, weighted equally; 30% from your scores on the in-class labs and homeworks, weighted equally; 10% from your end-of-semester case study presentation and paper; 10% from your forecasting scores (forecast game, briefings, participation).

Your final letter grade will follow the familiar scale: $\geq 90\%$ A, 87–89% B+, 80–86% B, 77–79% C+, 70–76% C, 67–69% D+, 60–66% D, $< 60\%$ F. University regulations concerning withdrawals and incompletes will be strictly enforced.

Academic integrity: It is expected that students are versed in the Code of Student Conduct Policy, and will abide by it. Repeated here are the provisions relating to academic dishonesty.

1. Academic dishonesty is the giving, taking, or presenting of information or material by a student that unethically or fraudulently aids oneself or another on any work which is to be considered in the determination of a grade or the completion of academic requirements or the enhancement of that student's record or academic career.

2. A student is guilty of a violation of academic integrity if he or she:

- represents the work of others as his or her own;
- obtains assistance in any academic work from another individual in a situation in which the student is expected to perform independently;
- gives assistance to another individual in a situation in which that individual is expected to perform independently;
- offers false data in support of laboratory or field work.

You have committed academic dishonesty if you give, receive, or tolerate others' use of unauthorized aid. Violations of academic integrity will result in automatic failure of the class and referral to the proper university officials. The work that you submit must be your own and you must have completed it specifically for the particular assignment in this class. Make no assumptions: please contact me if you are unsure about whether I have authorized a source of aid.