Professor: Dr. Matthew D. Parker  
Jordan Hall 5149  
513.4367, or main departmental office 515.3711  
mdparker@ncsu.edu  
Office hours: Wed. and Thurs., 2:00-3:15 PM; or, by appointment

Class meetings: Mon., 2:30–3:20 PM  
Tues., Weds., Thurs., 3:35–5:25 PM  
Jordan Hall 5131

Prerequisites: MEA 443 (and all of its prerequisites)

Required text: A Survey of Mesoscale Meteorology, 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: Ben Baranowski  
Jordan Hall 5138  
bcbarano@ncsu.edu  
Office hours: Tues. 10:30 AM–12:00 PM and Fri., 10:00–11:00 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 defendable,  
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. deriva-
tions), 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. em-
employees of the National Weather Service, Air Force Weather Agency, etc.).

Special accommodations: You have the right to appropriate, confidential accomodations of a disability. “Rea-
sonable 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 Regula-
tion (REG02.20.1)”
**Course organization:** Our tentative weekly schedule will proceed as follows: on Tuesdays–Thursdays, we will have one hour of lecture (3:35–4:35 PM), a short break during which we move up to the lab (4:35–4:45 PM), and then 40 minutes of forecast discussion (4:45–5:25 PM), which will be led by a team of student briefers. Mondays will serve as our in–class exercise and catch–all days, during which we will work on classroom and computer exercises together, review for examinations, hold make–up lectures (if needed), and conduct real–time case studies (led by Dr. Parker) when interesting mesoscale weather arises.

**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 Ray’s 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 in the case of a documented medical emergency.

**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 Tuesday–Thursday we will have oral weather discussions, much as in MEA443. The discussions will be performed by teams of two students each, on a rotating basis. 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 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 (NCWFC, briefings, participation).

Your final letter grade will follow the familiar scale: ≥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.