11:670:211 Meteorological Analysis
Course Syllabus
Fall 2016

Instructor Information

Instructor: Dr. Steven G. Decker
Office: ENR 227
Phone: 848-932-5750
E-Mail: decker@envsci.rutgers.edu
Office Hours: T 10–12 (or by appt)

Textbook

Required: *Weather Map Handbook,* Second Edition, by Tim Vasquez

Learning Goals

Upon completion of this class, students will be able to:

1. Conduct a weather discussion and make a seven-day national and local weather forecast, describing the weather that will occur and the mesoscale and synoptic weather systems that will be responsible.
2. Exhibit critical thinking when confronting new information.
3. Communicate clearly orally and in writing, including by electronic means.
4. Apply the mathematical and physical foundations of meteorology and climatology to solve problems using analytical and computational methods.

Purpose of the Course

Weather information is readily accessible over the internet, but what does all this information mean, and how can we use it to make forecasts? Broadly speaking, the purpose of this course is to get you down and dirty with real meteorological data to answer these questions. We start the semester examining in-situ observational data, and then turn our attention to computer-generated data, before ending the semester looking at remotely sensed data. We will also participate in the WxChallenge throughout the semester to get our feet wet with weather forecasting.

Grading Procedures

Class activities will contribute to your final grade as follows:

Class Exercises	35%	
Weather Discussions	20%	
Midterm Exam	20%	Monday, October 31
Final Exam (comprehensive)	25%	Wednesday, December 21, 8 AM

Exams will be given on October 31 and December 21. **If you have an issue with either of these dates, you must let me know immediately!** Although the final is comprehensive, it will focus mostly on topics covered after the midterm.

Class exercises are due at the beginning of class one week after they are assigned. Often, you will have time to work on them in class, perhaps on the following class day. Sometimes, these assignments will require computer resources to complete. **Bring colored pencils!**

Weather discussions are held at the beginning of each class. They last 10–15 minutes. Half of your weather discussion grade is based on how you perform when leading the discussion; the other half is

based on your attention when you are not leading the discussion (e.g., prompt attendance, asking questions, making comments, not checking Facebook, not sleeping). You are also welcome (but not required) to attend weather discussions led by the seniors on Fridays at 12:35 PM in Room 223.

We will participate in the WxChallenge, which is an intercollegiate forecasting contest administered by the University of Oklahoma. In this contest, we will issue forecasts four times a week (Mondays through Thursdays), with the forecast city fixed for two weeks at a time. This contest runs throughout the school year; this semester it will begin September 26 and end December 8. For this contest, you are only graded on your participation, but if you beat me over the course of the semester, I will award you one bonus percentage point on your final grade. In addition, if you win your division of the contest for a particular forecast city, you will receive one bonus percentage point on your final grade.

Your final percentage grade in the course will be a number between 0 and 106. These percentages will be converted to grades using the following scale:

A	91+	C	70–75
B+	86–90	D	60–69
B	81–85	F	<60
C+	76–80		

The grade cutoffs may be lowered, but they will never be raised. That is, a 91 is guaranteed to be an A, but a 90 may end up being an A as well.

Late Assignment Policy

I expect homework to be submitted on the given due date. However, I understand that unforeseen circumstances (e.g., illness, family emergency, computer crash, etc.) may hinder your ability to meet the due date. Thus, **you have two "late days" that you may use over the course of the semester.** You may turn in one assignment two days late, or two assignments one day late each, without being penalized. (Going from Friday to Monday counts as one day instead of three.)

Upon using your two late days, a late assignment will incur a 10-percentage-point drop for each day it is late, no matter what reason you have for being late.

Absence Policy

I don't keep track of attendance. However, I do keep track of your participation in the WxChallenge. **You have four free missed forecasts!** Each missed forecast after four will result in percentage point deductions off your final grade. I will not accept excuses for additional absences. EXAMPLE: Joe has a 91% for the course, but misses six WxChallenge forecasts. Subtracting four gives two left over, so Joe's final grade will be reduced by 2 percentage points to 89%.

Please use the Rutgers absence-reporting website at https://sims.rutgers.edu/ssra/ to automatically generate emails to each of your professors.

Your Feedback

I have taught this course many times. Most things will go right, but unfortunately, some things may go wrong. I welcome any feedback (positive or negative) you have about this course. You can provide this feedback in two ways:

- E-mail me, or talk to me directly. Not anonymous, but very effective.
- Slip an anonymous note in my mailbox.

Schedule

Date		*Topic*	*Reading*
September	8	Introduction, computer setup, time zones, and geography	4
	12	Weather discussions; units for temperature and pressure	
	15	METARs and the station model	122–3, 130
	19	Decoding METARs	133
	22	NWS text data	80–3
	26	Weather station field trip	
	29	Interpreting upper-air maps	10–7
October	3	Analysis of upper-air observations	
	6	Analysis of upper-air observations II	
	10	Analysis of surface observations	8–9
	13	Analysis of surface observations II	
	17	Vertical structure of the atmosphere	28–9
	20	The skew-T diagram	
	24	Numerical weather prediction	100–5
	27	Model output statistics & BUFKIT	
	31	**Midterm Exam**	
November	3	Ensemble forecasting	90–1
	7	Synoptic climatology and forecasting tips	
	10	Kinematics	22–3
	14	Plotting vorticity and divergence	
	17	Advection	
	21	Plotting advection	
	22	Geostrophic wind (NOTE: Thur. schedule)	
	28	Thickness and the hypsometric equation	18–9
December	1	Severe weather parameters	140–4
	5	Plotting severe weather parameters	
	8	Satellite imagery	33–46, 145–7
	12	Radar imagery	47–76
	21	**Final Exam** (8–11 AM)	