

METEOROLOGICAL INSTRUMENTS

ATMS 320

FALL 2007

PURPOSE

Observations provide the backbone for the science of meteorology. Regardless of your intended path in the atmospheric sciences, observations of the atmosphere will surely influence your career. So that you can properly interpret observations in your endeavors, you must understand the physics and limitations of common instrumentation. For example, predicting the weather requires an accurate initial state of the atmosphere and land surface. What good scientist would trust a model forecast without understanding the quality of the observations ingested as initial conditions? Can a climatologist properly assess climate change without understanding the characteristics of historical instrumentation or how instruments and observing sites have changed over time?



OBJECTIVE

This course is intended to equip meteorology majors with an understanding of the concepts involved in making careful meteorological measurements and to provide you with a fundamental understanding of historical and modern instrumentation. You will learn about the limitations of instruments and how to interpret instrument specifications, and you will identify the major errors associated with measurement output.

PROFESSOR

Dr. Christopher Godfrey

Office: Robinson Hall, room 234

Phone: 828-232-5160

E-mail: cgodfrey at unca dot edu

Office hours: 3–4 p.m. Monday and Wednesday, 1:30–2:30 p.m. Tuesday, or by appointment as necessary

CLASS INFORMATION

Meeting times: TR 3:10–4:25 p.m.

Location: Robinson Hall, room 238

Required text: Brock, F. V., and S. J. Richardson, 2001: *Meteorological Measurement Systems*. Oxford University Press, 290 pp. (ISBN: 0-19-513451-6)

Website: <http://facstaff.unca.edu/cgodfrey/courses/atms320/>

GETTING QUESTIONS ANSWERED

I will be in my office during scheduled office hours, but if at any other time you have a question and my office door is open, you are more than welcome to visit. Otherwise, e-mail is the best way to reach me. You may also schedule an appointment with me. Please don't hesitate to ask questions about class, other coursework, or the stresses of college life whenever the need arises.

IMPORTANT DATES

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|-----------------------------|------------|------------------|
| Thursday, 27 September 2007 | Exam I | In class |
| Thursday, 8 November 2007 | Exam II | In class |
| Thursday, 6 December 2007 | Final Exam | 3:00 – 5:30 p.m. |

COURSE OUTLINE

This course outline is approximate and subject to modifications, but hopefully we'll cover all of these great topics!

1. Introduction to measurement systems and meteorological data collection
2. Major modern measurement systems (Mesonet, ASOS, rawinsondes, etc.)
3. Data sampling
4. Basic electronics
5. Barometry
6. Static performance characteristics
7. Thermometry
8. Hygrometry
9. Dynamic performance characteristics
10. Anemometry
11. Precipitation measurement
12. Radiation
13. Soil moisture
14. Electric field and lightning measurements
15. Quality assurance
16. Site selection



EVALUATION

There will be two preliminary exams and a comprehensive final exam to assess your progress through the semester. The preliminary exams will take place during regular class meeting times. Several problem sets will strengthen your skills and reinforce the lecture and reading material. Some classes will also include lab exercises (I'll let you know about these at least one class in advance) so that you can play with some of the neat tools that we're studying. I will also surprise you with a few quizzes to gauge your understanding of what I'm trying to help you learn. Clearly, you are expected to attend every class.



There will be no opportunities for make-up quizzes, labs, or exams. Exams must be taken, and quizzes and labs completed, on the scheduled date. If you miss the class, you miss the grade. The *only* exceptions to this rule are: (1) serious medical condition (illness or injury) of you or an immediate family member; (2) University excused absence; (3) jury duty; or (4) military orders. Only in such instances will an item be dropped or rescheduled depending on your best interests, but *only if I am notified at least 24 hours in advance*. Except under the circumstances described above, **homework is due 35 minutes after the end of class** on the scheduled due date. This will allow you to run home and get your completed assignment if you forgot it! I will accept homework up to 24 hours late (5:00 p.m. the following day) for a 50% late penalty. *Homework more than 24 hours late will not be graded.* In the event of an unforeseen circumstance that causes you to miss an exam, lab, quiz, or homework due date, *you must notify me by phone or e-mail within 24 hours of the event.* Appropriate documentation must accompany any excused absence and should be attached to a late homework assignment.

GRADING

| | |
|-----------------------|-----|
| Preliminary Exams | 30% |
| Labs/Quizzes/Projects | 20% |
| Homework Assignments | 30% |
| Final Exam | 20% |

I reserve the option to curve the final grades upward at my discretion. However, you are guaranteed *at least* the following based on your final score before applying any curve:

| | | | |
|----|------------|----|------------|
| A | ≥92.0% | C | 72.0–77.9% |
| A- | 90.0–91.9% | C- | 70.0–71.9% |
| B+ | 88.0–89.9% | D+ | 68.0–69.9% |
| B | 82.0–87.9% | D | 60.0–67.9% |
| B- | 80.0–81.9% | F | <60.0 |
| C+ | 78.0–79.9% | | |

Final grades are not negotiable. If you see a problem with any other grade, you may plead your case no later than 14 days from the date I return the assignment to the class. I do make mistakes (occasionally)! Under no circumstances will your grade be *lower* if you see me with a question.

ACADEMIC INTEGRITY

Since the point of this or any class is to learn, you may collaborate on homework assignments, but *you absolutely must make sure that you hand in your own work*. Copying your friend's answers will not only be obvious to me, but will result in both of you sharing the credit for that answer. For example, if you do a fantastic job on the homework assignment and then let three of your friends copy *any part of it*, you will each receive a maximum grade of 25% for the assignment and you can take me off the list of folks willing to write you a good recommendation letter. Any collaboration on exams and quizzes is simply cheating. I have zero tolerance for academic misconduct and will deal with the problem by immediately filing charges through the regular University channels.



NOTES

Students with disabilities who require accommodations in this course are requested to speak with the professor as early in the semester as possible. Students with disabilities must be registered with the Disability Services Office prior to receiving accommodations in this course. The Disability Services Office is located in Lipinsky Hall, room 107, phone 828-232-5050.