

METEO 440W - ATMOSPHERIC MEASUREMENTS

FALL 2006

Meeting Tuesdays at 125 pm for Lecture. Lab Sections meet in Walker 126.

Lab Section 1 - Tuesdays 2:30-5:30 pm; Lab Section 2 - Thursdays 2:30-5:30 pm.

Instructor: Dr. Anne M. Thompson, amt16@psu.edu

Phone: 814-865-0479 Room: 510 Walker Bldg

Office Hours: Wed., Thurs, 11-noon. or by appointment

Teaching Assistant: Ms. Margaret Root, mjn159@psu.edu

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Office Hours: Wed., 11-noon, Thurs, 1030-1130

COURSE OBJECTIVES: These are threefold and related to one another.

- (1) Learn principles and techniques for making common physical and chemical measurements related to the atmosphere. Some of these will illustrate theory and concepts taught in Meteo 431, 436 and 437.
- (2) Learn about observations and data, including precision, accuracy and simple statistical analysis. Learn to analyze sets of measurements to discover properties and behavior of the atmosphere.
- (3) Learn how to report and write up scientific results in standard form, with Abstract, Introduction, Experimental/Method/Procedure, Results, Discussion, Conclusion, referencing where appropriate.

CLASS FORMAT AND CONTENT:

A combination of one 50-min lecture and one 3-hr laboratory session each week. Lectures will describe general measurement approaches, additional background for specific experiments and data sets, error analysis. There will also be lectures and class discussion on elements of writing. Discussion will include analysis of published work and class work in progress.

There are 8 laboratory Experiments for which written reports with "Results" and "Discussion" sections are due. Other sections will be assigned as Homework. A data analysis project in the last weeks of class will hone your new analytical and writing skills in a Final Report. The Final Report will be graded on technical and analytical skills demonstrated in the text as well as on originality and writing elements.

Experiments are posted on ANGEL. Expect to work hard, have fun and leave the course with mastery of rudimentary laboratory skills and more confidence in your written scientific work.

COURSE CREDIT:

Grade is based on four elements, as below. The Final Report replaces a Final Exam. Active participation in class and laboratory are important in 440W and are a significant part of the grade.

- (1) Laboratory Reports, 40%
- (2) HW & Exam, 25-30%
- (3) Final Report, 20-30%
- (4) Class Participation, 10-15% Total = 100%

EXPECTATIONS OF CLASS:

- (1) Punctuality in class and lab. The lecture is short and labs can be long. The Tuesday lecture precedes the lab session. Set up periods are required for the lab.
- (2) No missed classes or labs because it is unfair to your lab partner, limited equipment is available and to the Teaching Assistant (TA), who has heavy instructional responsibility. Arrangements for switching to a different section for a given week must be made in advance with the TA.
- (3) Assignments handed in on time. Lateness is unfair to other students and you will lose points. The grading burden on the Instructor and TA in this course is too heavy for exceptions.
- (4) Class participation, initiative and creativity are valued in the lab and in written assignments.
- (5) LAB CLASSES!!! "SAFETY FIRST" IS A GOOD MOTTO. You will be handling delicate and expensive equipment in some cases. Be careful.

ACADEMIC INTEGRITY AND STANDARDS:

I remind you of the College Policy on Academic Integrity. Written assignments are to be YOUR OWN work only. In addition, there are special rules for data handling. You will work in pairs to generate the data. You and your partner will only use your own data in the reports.

OTHER NOTES:

Let Instructor or TA know in advance of religious observances, any required disability accommodation.

Text & Reference:

ISBN - 0-19-513451-6

Meteorological Measurement Systems, by F. V. Brock and S. J. Richardson, Oxford Univ Press, 2001.

These books might be useful.

J. Wallace & P. V. Hobbs, *Atmospheric Science*, Introduction to Meteorology

J. H. Seinfeld & S. N. Pandis, *Atmospheric Chemistry and Physics: From Air Pollution to Climate Change*, Wiley-Interscience, 1998.

P. V. Hobbs, *Introduction to Atmospheric Chemistry*, Cambridge University Press, 2000.

G. W. Petty, *A First Course in Atmospheric Radiation*, 1st or 2nd edition, Sundog Press, 2004, 2006.

P. V. Hobbs, *Basic Physical Chemistry for the Atmospheric Sciences*, Cambridge University Press, 1995; 2nd ed., 2000.

12 Tues, 21 Nov Thanksgiving Week - No Class or Lab

13 Tues, 28 Nov Review Exam. B&R Project in Lab
AQ and/or Sonde Lecture Chap 12.1, 12.2

14 Tues, 5 Dec Review Class. Project Q/A Project in Lab

15 Tues, 12 Dec Class does not meet. Any Lab finish & Report
Final Report Due - 14 Dec. **No exceptions**
