

ATMO-446
Physical Meteorology
Spring Semester, 2008
TR 8:00 AM - 9:15AM in CSA 303

Instructor: Dr. Richard Orville
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Office hours: TBA

Required texts: (Sorry, but yes, you really need BOTH of these!)

1. *A Short Course in Cloud Physics*, 3rd edition, by R.R. Rogers and M.K. Yau, 1994.
2. *A First Course in Atmospheric Radiation*, 2nd edition, by Grant W. Petty.

Supplemental reference texts:

1. *Atmospheric Science, An Introductory Survey*, 2nd edition, by J.M. Wallace and P.V. Hobbs, 2006. (For reinforcement, or just a second perspective, if you are struggling with concepts in either of the required texts.)
2. *The Physics of Atmospheres*, 3rd edition, by J. Houghton, 2006. (A good reference for radiation and related topics.)
3. *An Introduction to Atmospheric Physics*, by R.G. Fleagle and J.A. Businger, 1980. (Graduate level, if you are interested in more details on a particulate topic.)

Course Assignments and Grades:

There will 2 tests during regular class hours, and the dates of these in class quizzes are to be determined. A final exam will be given on May 5th, Monday, from 1-3 pm.

Grades will be weighted as follows:

Tests 50% (2 tests at 25% each) Tests to be given 1/3 and 2/3 through the course; dates to be determined.

Final 40%

Homework and In-Class Assignments: 10%

Grades will be assigned according to the following scale:

A= 90-100%, B= 80-89%, C=70-79%, D 60-69%, F 59% and below.

The instructor reserves the right to curve the grading scale, as needed.

Late policy: For full credit, homework must be turned in on the day it is due. Late homework may be turned in, but the grade will be penalized 10%.

Unscheduled absences from exams will receive a grade of zero. Approval to miss an exam must be granted by the instructor 24 hours in advance. Also, you must schedule a makeup exam with the instrument within one week of the regularly scheduled exam.

Topics to be covered in this course:

Unit 1: Aerosols and Cloud Microphysical Processes

Topics:

1. Atmospheric Aerosols and Clouds
2. Observed Properties of Clouds
3. Cloud Droplet Formation
4. Droplet Growth by Condensation
5. Warm Cloud Precipitation
6. Ice Nucleation and Ice Crystal Growth
7. Lightning

Readings:

- Introduction, no reading
R&W, Chapter 5.
R&W, Chapter 6.
R&W, Chapter 7.
R&W, Chapter 8.
R&W, Chapter 9.
Instructor notes

Unit 2. - Radiation

Topics:

1. Why Radiation is important to Climate and Weather
2. Electromagnetic Radiation
3. Thermal Emission
 - Blackbody radiation
 - Emissivity
 - Applications
4. Radiative properties of natural surfaces
5. Atmospheric Transmission
6. Atmospheric Emission
 - Schwarzschild' equation
 - Radiative Transfer in a plane parallel atmosphere
 - Applications

Readings:

- Petty, Chapter 1.
Petty, Chapter 2-3
Petty, Chapter 6.
Section 6.1
Section 6.2
Section 6.3-6.4
Petty, Chapter 5.
Petty, Chapter 7
Petty, Chapter 8
Section 8.1
Section 8.2
Section 8.3

Important Dates:

- April 24, Thursday: Last day of 446 lecture
April 29, Tues. TAMU last day of class. Re-defined day: Go to your Friday class.
May 5th, Monday: Final exam will be given, from 1-3 pm.

Americans with Disabilities Act (ADA) Policy Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, the legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall or call 845-1637.

Academic Integrity Statement

According to Student Rule 20.1.3, plagiarism occurs when a writer does not cite sources of information or uses work done by someone else as if it were his or her own. You should credit your use of anyone else's words, graphic images, or ideas using standard citation styles. If I should discover that you have failed to properly credit sources or have used a paper written by someone else, I will recommend that you receive an F in this course. You will have the right to submit a written appeal to the department head, as outlined in Student Rule 52.

If you have more questions about plagiarism or syllabi, you can visit the University Writing Center website:

http://uwc.tamu.edu/faculty/pedagogy/manage/syllabus_require.html