

# METR 4233 – Physical Meteorology III: Radiation and Climate Fall 2009

**Instructor:** Dr. Susan Postawko  
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**Office Hours:** Monday and Wednesday 1:00-2:00 pm, *or by appointment*

**Teaching Assistant:** Matt Elliott  
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**Class time and place:** MWF 12:00-12:50 pm, Room 5600 NWC

**Textbook:** Wallace, J.M. and P.V. Hobbs, 2006: *Atmospheric Science: An Introductory Survey*

**Web site:** Course information and lecture notes will be available through <http://learn.ou.edu>

**Grading:** 4 exams - 20% each  
Tentative exam dates: September 18; October 14; November 13; December 11

**Homework – 20%**  
There will be approximately 5 homework assignments throughout the semester

## General Information

This course introduces students to the physical processes associated with radiative transfer in the atmosphere, and energy balance at Earth's surface. Fundamental concepts of radiative transfer are further applied, in conjunction with basic ideas of atmospheric dynamics and thermodynamics, to explain the general circulation of the atmosphere, surface energy budget, the mean climate of Earth, climate variations in space and time, and climate change.

## Course Outline

**I.** The Earth System: Components of the Earth System; survey of the atmosphere, oceans, cryosphere, biosphere, lithosphere. Hydrologic and carbon cycles.

**II.** Radiation and radiative transfer in the earth-atmosphere system: Radiation characteristics; quantities and units; electromagnetic spectrum; emission, absorption, scattering of radiation

**III.** Energy balance: Radiative fluxes; surface energy balance; diurnal cycle and seasonal cycle of surface temperature; global radiation balance and energy balance

**IV.** Atmospheric general circulation; Meridional gradient of net radiative heating; global heat and momentum balance

**V.** Climate variability and climate change: A brief history of climate; nature and causes of climate change; climate feedbacks; El Niño-Southern Oscillation; greenhouse climate change; ozone

## Important policies:

**Reasonable Accommodation:** The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodation in this course are requested to speak with me as early in the semester as possible. Students with disabilities **must** be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166, phone 325-3852 or TDD only 325-4173.

**Academic Misconduct:** All provisions of the Norman Campus Academic Misconduct Code shall apply in cases of academic dishonesty. Any violation of the Academic Misconduct Code will result in your removal from this course, and a grade of F will be recorded for the course. Academic misconduct is defined as “any act that improperly affects the evaluation of a student’s academic performance or achievement.” At the University of Oklahoma, academic integrity is expected from each student. Misconduct such as plagiarism, fabrication, and fraud, as well as attempting to commit such acts or assisting others in doing so, will not be tolerated. Students are responsible for knowing the OU Academic Conduct Code, which can be found at <http://www.ou.edu/studentcode> and <http://www.ou.edu/provost/integrity>

