Department of Atmospheric Sciences

COURSE ANNOUNCEMENT – SEMESTER I – 2003–2004

ATMOS 497L: Advanced Methods in Radiative Transfer

Call number:	00880
Instructor:	Prof. Larry Di Girolamo, 112 Atmos. Sci. Bldg., 333-3080
E-mail:	`larry@atmos.uiuc.edu`
Room and Time:	109 Atmos. Sci. Bldg.; 2:30 – 3:45 p.m., Tu Th
Credit:	4 hours or 1 unit
Prerequisites:	Atmos 313, Atmos 451, or Atmos 497K, or consent of the instructor

Radiation is the ultimate source of energy that drives our climate system. It is also the quantity that is sensed by satellites to obtain information about the Earth's surface and atmosphere. This course is intended for students who require advanced skills in modern methods to solve radiative transfer problems. The focus of the course will be to give students hands-on experience with a wide variety of numerical techniques used in solving a wide range of radiative transfer problems encountered in atmospheric sciences. This will be achieved through in-class exercises, take home assignments, and term projects.

Course Content:

1. Overview of atmospheric radiation and transfer
2. Absorption, the HITRAN database, and broadband considerations
3. Methods for computing single scattering properties
4. Exact analytical solutions and limiting cases in radiative transfer
5. Exact computational methods in radiative transfer
6. Approximate computational methods in radiative transfer
7. Comparing numerical accuracy amongst methods

Text: *An Introduction to Atmospheric Radiation*, 2nd Edition, by K.N. Liou, Academic Press, 2002. (Required)