

Atmospheric Sciences: Atmospheric Remote Sensing 666  
T Th 2pm-3:30pm in TBD

Instructor: Prof. Kenneth Sassen

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For homework I will ask for a combination of occasional assignments and a 10-12 (double-spaced) page research paper giving a detailed account of a remote sensing research topic of your choice. You will provide the background of your topic through a comprehensive literature search, describe the instrument design and theory, and review how the data has added to our knowledge of the atmosphere. So, keep your eyes open for a topic of interest during the semester. The paper will be due one week before the end of classes, but can be submitted at any time.

Ethics:

Do not cheat on your exams or plagiarize your paper- you are only cheating yourself. Any student turning in a paper not written by himself (such as copied from the Internet or purchased from a company) will flunk the entire course.

Disabilities:

Students with documented disabilities who may need reasonable academic accommodations should discuss these with me during the first two weeks of class. You will need to provide documentation of your disability to Disability Services in the Center for Health and Counseling, 474-7043, TTY 474-7045.

Schedule:

| <u>Lesson Number</u> | <u>Topic</u>   |
|----------------------|--|
| 1                    | Course Outline and Fundamentals  |
| 2                    | Properties of Electromagnetic Waves  |
| 3                    | Principles and Designs of Remote Sensors                                   |
| 4                    | Propagation of Electromagnetic Waves: Refraction and molecular attenuation |
| 5                    | The Basic 'Radar' Equation   |
| 6, 7                 | Backscattering and Attenuation from Spherical Particles                    |
| 8, 9                 | Backscattering and Attenuation from Nonspherical Particles                 |
| 10                   | Backscattering and Attenuation from Inhomogeneous Particles                |
| 11                   | First Exam   |
| 12, 13               | Meteorological Applications: Cloud Physics Research                        |
| 14                   | The Bright and Dark Bands (Sassen and Chen 1995)                           |
| 15                   | NEXRAD Radar Applications (NWS)  |
| 16, 17               | Overview of Remote Sensing Techniques                                      |
| 18, 19               | The Multiple Remote Sensor Approach (Sassen 1984)                          |
| 20                   | Second Exam  |
| 21, 22               | Cirrus (Sassen and Mace 2001)  |
| 23                   | Field Trip to AFARS for Data Collection                                    |
| 24                   | Stratus Clouds (Sassen et al. 1999)  |
| 25                   | Mixed-Phase Clouds   |
| 26                   | Aerosols and Cloud Interactions (Sassen 2001)                              |
| 27                   | Convective Systems, Hail and Rainfall                                      |
| 28                   | Field Trip to AFARS for Data Collection                                    |
| 29, 30               | Review for Final   |

Important Dates:

|            |                          |
|------------|--------------------------|
| 1/20       | First day of class       |
| 2/4        | Drop Day                 |
| 3/25       | Last Day for Withdrawals |
| 5/6        | Last Day of Classes      |
| 9 – 12 May | Final Exam Week          |