

ATMOSPHERIC SCIENCES 411/611 Fall 2010

Introduction to Atmospheric Physics

Taught by: Pat Arnott.

Office hours: Tuesday and Thursday 1 - 3 pm, RM 213 Leifson Physics, and at other times by appointment. Please feel free to take advantage of them.

Contact: patarnott@gmail.com, 775-784-6834.

Course Administration: <http://www.patarnott.com/atms411/> and webct.unr.edu.

Time and Place: Tues / Thurs 9:30 am until 10:45 am, Room 300 Leifson Physics

Textbook: Atmospheric Science: An Introductory Survey by Wallace and Hobbs.

OUTLINE:

The objectives of this practical course are:

1. To learn about the thermodynamic structure of the Earth's atmosphere from the surface through the troposphere, stratosphere, mesosphere, thermosphere, and ionosphere: The origin of the atmosphere. Loss of atmospheric gases at the top of the atmosphere and gain of atmospheric constituents from space.
2. To learn about skew-T logP thermodynamic diagrams for the atmosphere, and the foundation for each curve on this plot.
3. To learn about aerosols and clouds, and the connections between them.
4. To learn about atmospheric radiation transfer, including solar radiation, infrared radiation, single and multiple scattering, light scattering by aerosols and cloud hydrometeors, the factors affecting the Earth's radiation balance, the role of radiation in weather and boundary layer dynamics, and the precise meaning of the greenhouse effect. Some questions we will explore are these: why are clouds white, skies blue, what would the sky look like if you could see at infrared wavelengths, and why it matters.
5. To have an introduction to global scale circulation of the atmosphere.

GUIDE TO DOING WELL IN THIS CLASS:

(My observations of students that get the most out of their course work during this brief time in life when you get to be a student)

1. Attend class, every class. Ask questions in class. I benefit greatly from questions students ask in class as it helps me refine my understanding of the subject matter, and it helps me convey topics more effectively. Other students benefit as well. I am

very open to questions in class, and find that when we have a discussion rather than a monologue, we all get a lot more out of our time together, and we can make interesting discoveries as we go along.

2. Do the homework every time, on time. This class will involve a lot of homework, in the form of a few questions due for every meeting.
3. Work with others on the homework so that you learn to work in a group, and you gain the insights of others as they gain from you.
4. Be sure you thoroughly understand the homework.
5. Arrange your daily schedule so that you have time for sleep at night, and can digest the course material daily. Work on each course a little each day.
6. Get started early on everything. It helps cement your knowledge.
7. Eat well, and get some exercise. Some diversions help refresh your enthusiasm and skill.
8. Attend office hours to ask questions and refine your understanding of the subject matter.
9. Seek connections with the subjects of this course and others you are taking or will take later on.
10. Pay close attention to subjects that are of great interest to you, and if you find a fit, use these subjects in a senior thesis project.

GRADING:

ATMS 411: 40% on homework. 20% on exam 1. 20% on exam 2. 20% on final exam.

ATMS 611. 30% on homework. 20% on final paper or project. 15% on exam 1. 15% on exam 2. 20% on final exam.

Final Exam:

Friday December 10th from 7:30 am to 9:30 am.

Special Needs:

Any student with a disability needing academic adjustments or accommodations is requested to contact the instructor as well as the Disability Resource Center in Thompson Student Services 107 as soon as possible to allow for appropriate arrangements.