ATMO 680: Physical Meteorology

Professor: Dr. Nathaniel Brunsell
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Class time and Place: MWF 1:30-2:20, LINDLEY HALL 228
Office Hours: MW 9 – 10 AM or by appointment
Prerequisites: Math 123 and PHSX 212

Course Overview:

By the end of this course, you should have developed an appreciation for the full range of atmospheric processes from molecular to global scales through a thorough understanding of the physics. We will use theoretical development and practical applications to help develop an intuition concerning the flow of heat, energy, and mass through the atmosphere over a large range of spatial and temporal scales. This material can enhance your understanding of the atmosphere whether you simply want to understand what you see, or you wish to develop computer simulations to address meteorological and climatic research questions. Our specific goals are to help you:

1. Gain a theoretical foundation of atmospheric physics.

2. To understand when and where the theory is applicable and the assumptions made in the development of the theory, as well as the limitations and when it is not applicable.

3. To acquire competence the scientific method and to critically evaluate information.

Please keep these goals in mind as you evaluate your learning and the course itself.

Assigned readings will supplement the lectures, and are meant to be completed prior to the meeting time. In order to obtain the goals outlined above, it is necessary for you to be actively involved by asking questions throughout the course. *By your continued enrollment, we assume that you accept the syllabus as a contract of responsibilities and expectations.*

Text Book:

- ***Fundamentals of Atmospheric Physics***, by M Salby, Academic Press, 1996.

This book was chosen since it presents a good balance between the detailed physics and larger scale implications without getting to bogged down in derivations. Readings will be supplemented with handouts.

Assessment:

My general approach to assessment is to use homework to develop practical experience solving problems, while in-class exercises and exam questions are designed to stress the integration of several concepts or application of the theory to different scenarios.

15 % Midterm 1
15 % Midterm 2
35 % Final Exam
35 % Homework/in-class exercises

Homework:

Homework will be handed out on approximately weekly and will be due on the following week. **Credit will not be given for late work**. In return, you will be able to drop 1 homework assignment. In addition, there will be several in class exercises based primarily on the assigned readings and the material covered in the previous lectures. I encourage you to work together to answer homework questions, as discussion is often the best way to ensure that you fully understand the material, however every student must turn in their own work.

Students with Disabilities:

The staff of Services for Students with Disabilities (SSD), 135 Strong, 785-864-2620 (v/tty), coordinates accommodations and services for KU courses. If you have a disability for which you may request accommodation in KU classes and have not contacted them, please do so as soon as possible. Please also see me privately in regard to this course.

Cheating:

Cheating in any manner will not be tolerated. Note that cheating includes handing in for credit work that is not your own (including copying from other students or plagiarism). Any student discovered cheating will be given an F for the course and a letter explaining that the grade was given for academic misconduct will be sent to the student's school or college.

Tentative Schedule:

Date	Topic	Chapter
8/19	Introduction, gas laws and composition	1
8/26	Thermodynamics	2
9/9	Second law	3
9/23	EXAM 1	
9/26	Heterogeneous systems	4
10/14	Transformations of moist air	5
10/28	EXAM 2	
10/31	Hydrostatic equilibrium and stability	6/7
11/14	Aerosols and cloud physics	9
12/14	FINAL EXAM	