Physics 335, FALL 2016

Lecture : Physics, Room 201, Tu Th 10:00-11:15 AM

Instructors (1): Dr. Sergio DeSouza-Machado (sergio@umbc.edu)
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Office Hours: After class, or by appointment.

Instructors (2): Dr. Ruben Delgado (delgado@umbc.edu)
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Textbook: Atmospheric Science : An Introductory Survey, 2nd Edition by Wallace and Hobbs
Online Textbook: https://www.eoas.ubc.ca/books/Practical_Meteorology/
Practical Meteorology: An Algebra-based Survey of Atmospheric Science by R. Stull
Online Textbook: http://acmg.seas.harvard.edu/people/faculty/djj/book/
Introduction to Atmospheric Chemistry, by Daniel J. Jacob, Princeton University Press, 1999

Course overview and organization

PHYS 335 is a first course in the physical and chemical principles that led to the formation of the Earth's atmosphere, its structure and processes. The level of the material covered in the class is based on Physics 121 and 122. The physical principles together with mathematical techniques presented this semester should help you with many of the upper level Physics classes (and graduate courses, if you choose to go on) you will be taking in the future, as well as make you understand some of the environmental issues facing society today, namely global warming and renewable energy sources.

Since there will be a wide variety of topics presented in the class during the semester, we have chosen one general text-book (by Wallace and Hobbs) as well as two books available online. In addition we will be presenting material from other books, so daily class attendance is not only expected, it will be very helpful!

Prerequisite : Physics 121,122 : we will use and expand on concepts from these two classes
You will be assumed to know algebra, trigonometry, geometry and calculus (integrals, derivatives, differential equations).
As the semester progresses, we may make some (Matlab) source code and data files available for you to download over the web, so you can use them to explore and reinforce certain physics concepts.

Grading

Homework	30 %
2 MidTerm Exams	50 %
Class Project	20 %

Grade breakdown :(A) 90-100 (B) 80-89 (C) 70-79 (D) 60-69 (F) below 60

Homework

Many Physics education studies show that students do much better when they keep up with the material and come to lecture prepared - this course is organized with this in mind. Homework will be collected and graded. The hour exams during the semester will be based on the lecture material and homework.

Homework solutions will be posted after the due date. You are welcome to work in groups, but the final turned in homework should represent *your* work. Also, avoid turning in late homework – it is unfair both to your fellow students and to us.

Exams/Project

We will reserve a couple of classes (at the end of the semester) for group project presentations. Based on class size we expect about 8 groups each consisting of about 3-4 people. Each person in the group should make a substantial contribution to the presentation. The projects should be based on what is/was taught in class. Please select a topic and check it's suitability with the instructors well in advance, and prepare enough slides for a 15 minutes presentation per group.

Two midterm exams will consist of problems of the type practiced through doing the homework. You will be expected to be able to come up with both algebraic and numeric answers as needed. There will be two midterm exams, and one class project. The midterms will be announced at least a week in advance; *it is your responsibility to stay informed about the dates.*

For both homework and exams, you need to show your work clearly (which also includes being neat and legible!), with all steps and assumptions, to get credit. *The easiest way to do this is to get into the habit of neatly showing all your steps and reasoning, on your homework.* Even if the final answer is wrong, partial credit will be given where it is due. Draw diagrams if needed, use the correct units. No work shown implies no credit, unreadable solutions also will not be given credit.

Missed exams can only be made up under very special circumstances, such as official university business or illness. Please make prior arrangements with us well in advance

Office hours

Office hours will be set after classes start. Typically we will be available after lectures to answer questions, and you can always contact us using email or come to our campus office(s).

General Schedule

Below is the generic calendar outline for the semester. Actual hour exam dates will be announced about a week in advance; *YOU are responsible for knowing the dates of exams (and presentation schedule), so plan to attend all classes!!*

Weds, Aug 31, 2016	First day of Fall 2016 class
Thursday, Sept 1, 2016	First day of P335 class
Thursday, October 20, 2016	Mid Term Exam I
Thursday Nov 24-Sun Nov 27, 2016	Thanksgiving Break
Tu/Th, December 6,8, 2016	PRESENTATIONS
Tuesday, December 13, 2016	Mid Term Exam II
Tuesday, December 13, 2016	Last day of classes

Topic breakdown

This is a very rough outline *and is subject to change*. Come to class to keep abreast of the schedule.

Week	Date	Topic	Instructor	Material
1	Aug 31	Introduction	SM	Class Outline
				Journey through Space and Time
2	Sept 5	Solar System	SM	Planet/Atmosphere Formation
		Energy		Fossil fuels, Renewable energy
		Optics		Mirages, rainbows, sundogs
3	Sept 12	Thermodynamics 1	RD	Stability, mixing ratios
				Composition, vertical structure
4	Sept 19	Clouds	SM	ISCCP classification
				Cloud Droplets formation
5	Sept 26	Dynamics	SM	Coriolis forces
				Navier Stokes
6	Oct 3	Radiative Transfer	SM	Spectroscopy
				Radiative Transfer
7	Oct 10	Climate Models	SM	0D,1D,EBM
8	Oct 17	Extra Topics TBD	SM	
				Exam 1
9	Oct 24	Thermodynamics II	RD	Intro
10	Oct 31	Atm. Chemistry	RD	Intro
11	Nov 7	Meteorology	RD	Basics
			RD	Weather Maps
12	Nov 14	Aerosols	RD	Intro
13	Nov 21	Air Quality	RD	Intro
14	Nov 28	Remote Sensing	RD	Orbital geometry
				Passive sounders (IR/MW/Vis)
				Active sounders (lidar/radar)
15	Dec 5	PRESENTATIONS	SM/RD	about 15-20 min/group
16	Dec 12		RD	Exam II

Note on academic integrity:

You are expected to uphold the UMBC Code of Student Conduct for Academic Integrity (see http://www.umbc.edu/provost/integrity/index.html). If I feel it is necessary to do so, I will report academic misconduct to the Academic Conduct Committee. See also the UMBC Academic Integrity Site http://www.umbc.edu/provost/integrity_faculty.htm)

While you are encouraged to work together on homework, you can only turn in your own work. **Cheating on exams, quizzes and turned-in H/W is absolutely prohibited.**