Atmospheres & Remote Sensing

PTY517
Space Sciences Building, Room 301
Tuesday and Thursday 12:30-1:45

Instructor: Dr. Caitlin Griffith

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Office Hours: Thursday 2:00PM, or by appointment
Class Website:
http://www.lpl.arizona.edu/graduate/classes/spring2015/Griffith_517/

Objectives:
This course provides an overview of the physics and chemistry of planetary atmospheres including the thermodynamics, energetics, radiative processes, dynamic meteorology, and chemistry and diffusion. Students are assumed to have basic knowledge in undergraduate physics and vector calculus. The course introduces the main characteristics of the atmospheres in our solar system, and explores the physical processes manifest in the diverse atmospheres in the Solar System and Exoplanets. Atmospheric processes are discussed in the context of current scientific questions regarding the structures and evolutions of planetary and exoplanetary atmospheres.

Text Book: *The Physics of Atmospheres* by John Houghton.

Reference Books: (on Reserve in LPL library)

The following books cover general aspects of planetary atmospheres and will be referred to from time-to-time in the course.

Atmospheric Physics by David Andrews
Atmospheric Thermodynamics by Bohren and Albrecht
Theory of Planetary Atmospheres by Chamberlain and Hunten
An Introduction to Dynamical Meteorology by James Holton
Atmospheric Radiation by Goody and Yung

Grades will be based on three components weighted as follows:

40% Homework
30% Project
30% Quizzes (1st 12%, 2nd 12%, 3rd 6%)

Quizzes

There will be three in-class quizzes. The purpose of these quizzes is to reinforce the basic concepts and also inform the instructor whether the students are being instructed. The last quiz is a "mini quiz" on the planets derived from the student lectures and notes, after reviewed by the professor. There will be no final exam.

Project

One paper and an accompanying 20 min presentation are required for the student to complete the course. Each student will pick a planetary atmosphere and research its composition, temperature-pressure structure, cloud structure, as well as the atmospheric chemistry, dynamics, radiative processes and surface conditions (where applicable) that establish and explain the basic properties of the atmosphere. The student will discuss the original observations that led to the discoveries of the basic characteristics of planetary atmospheres. In addition they will briefly outline the assumptions that underlying the interpretation of the observations including models, including the dynamical, chemical, and radiative models based on the observations. This discussion will allow the student to understand and appreciate the current open questions in the field of planetary atmospheres. Detailed guidelines of the project are given in a separate write-up.

Homework

There will be roughly 5-8 homework assignments, which taken together comprise 40% of the grade. Students are encouraged to talk to each other and to the professor, if they have questions. However the homework solutions should be written independently and the detailed math and logic of the solutions should be realized independently. Late work will not be accepted except in extraordinary circumstances.

Grade Scale

All students (Graduate and Undergraduate) will be graded on the following scale.

A: 100%—90%
B: 89%—80%
C: 79%--70%
D: 69%--60%
Below 60% is a failing grade

At the University of Arizona we strive to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, you are welcome to let me know so that we can discuss options. You are also encouraged to contact Disability Resources (520-621-3268) to explore reasonable accommodation.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Information contained in the course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.

Absence and Class Participation Policy

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, http://policy.arizona.edu/human-resources/religious-accommodation-policy.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: https://deanofstudents.arizona.edu/absences

Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students.

Accessibility and Accommodations

Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit http://drc.arizona.edu.

Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See:
http://deanofstudents.arizona.edu/codeofacademicintegrity
http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity.

The University Libraries have some excellent tips for avoiding plagiarism, available at http://www.library.arizona.edu/help/tutorials/plagiarism/index.html.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA e-mail to sell or buy these

copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail addresses. This conduct may also constitute copyright infringement.

UA Nondiscrimination and Anti-harassment Policy
The University is committed to creating and maintaining an environment free of discrimination; see http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy
Recommended language: Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

Additional Resources for Students
UA Academic policies and procedures are available at http://catalog.arizona.edu/policies
Student Assistance and Advocacy information is available at http://deanofstudents.arizona.edu/student-assistance/students/student-assistance

Confidentiality of Student Records http://www.registrar.arizona.edu/personal-information/family-educational-rights-and-privacy-act-1974-ferpa?topic=ferpa