Instructor: Dr. Jose Vanderlei Martins
Office Hours: Fri 2:00–3:30pm or other times scheduled with instructor.
Physics Building – room 429
Phone: 301-828 7471
martins@umbc.edu

Lectures Time/Place:
Tue/Thu: 14:30-15:45

Webex link:
https://umbc.webex.com/umbc/j.php?MTID=m8d2d214208ef4dd05a79fcac87608773

Grading Method:

Final Exam (25%), Mid-Term Exam (25%), Project (25%), Homework (25%)

Suggested Textbooks: (not required)

- John R. Schott, 2009; Fundamentals of Polarimetric Remote Sensing, SPIE Tutorial Text Vol. TT81

- G. L. Stephens, Remote Sensing of the Lower Atmosphere, 1994, Oxford University Press.

- W. G. Rees, Physical Principles of Remote Sensing, 2001, 2nd. Edition, Cambridge University Press.

- Jacqueline Lenoble, Lorraine Remer, and Didier Tanre, Aerosol Remote Sensing, 2013 Springer-Praxis.

Obs: A number of www-based aides, summary notes, etc. will be available but the students are always encouraged to take their own notes.

Course Syllabus

PHYS 722 ***Remote Sensing of the Earth's Atmosphere*** [3 credits]

(from Catalog) Techniques for the passive and active remote sensing of the state and composition of the Earth's atmosphere. Fundamentals of radiative transfer as applied to remote sensing. Introduction to measuring radiation and designing passive and active instruments; theoretical background and algorithmic considerations for the passive and active sensing of aerosol and cloud properties; atmospheric profiles of temperature, humidity and trace gas concentration; and the state and composition of the Earth's surface.

Prerequisite: ***PHYS721, or instructor's authorization.***

Course Description and Objectives:

The course will explore passive and active remote sensing techniques that are commonly used to explore Earth's atmospheric and surface properties from ground, aircraft, and space platforms. Students will apply their radiative transfer background from previous courses to simulate the remote sensing measurements and to develop sensors and algorithms to measure physical parameters of the atmosphere and surface. Particular emphasis will be given to the remote sensing of aerosol and cloud particles.

At the end of the course, students are expected to be able to:

a) Distinguish and describe the designs of passive and active remote sensing instruments

b) Identify and explain theoretical principles of ground- and satellite-based radiation measurements

c) Develop and evaluate retrieval methods for sensing aerosols, clouds, precipitation, and atmospheric profiles of temperature, humidity and/or trace gas concentration

Note: *The emphasis on a given topic or the course content may vary according to specific interests of the class and links with special events on Atmospheric Remote Sensing.*

Course Work:

- ***Homework*** assignments will be given periodically covering subjects discussed or related to topics discussed in class or related to the class project.
- A ***Project*** topic will be selected at the beginning of the course and the students will develop it along the whole semester. Individual students will make oral presentations on their results and turn in a final report with no more than 10 pages. The report must be well organized, well written, and present references following an AGU publication-like standard.

- The ***mid-term*** and ***final exams*** will be cumulative, covering the entire subject discussed up to their dates. At the instructor's discretion, these exams could be given as take home exams.

Policies & Expectations

Policy on Attendance for presential classes:

Attendance at most lectures is **optional** - the only **exceptions** being for Quizzes, Exams and Project Presentations (*see below*). Despite being optional, it should be stressed that you are **strongly encouraged to attend** the lectures. They are an integral part of the course.

A note on **Classroom Etiquette**: You are expected to show the professor and your fellow students respect. You are expected to arrive prior to the start of the lecture, and not to leave until after the end of the lecture. You are expected to pay attention to the lecture, and usually to take notes. Behavior such as reading non-course related material, wearing headphones, disrupting fellow students *etc* are unacceptable. *If* you need to clarify a point with your neighbor, please do so in a "hushed manner". You are encouraged to ask questions, but to do so you are expected to raise your hand & wait to be called upon.

Please turn cell-phones OFF prior to entering the lecture hall.

Laptops are allowed and even encouraged in this class as they can be used for real time calculations, simulations, data analysis, programing, image displaying and plotting.

Policy on attendance for remote/virtual classes:

Students are required to have a good internet connection and have camera and microphone for exams and presentations. Students are encouraged to actively participate in class discussions and presentations. As a courtesy, students are asked to activate their cameras to enhance discussion and participation in class. In class assignments, discussions and presentations will often count as class grades towards homework assignments or course project, as appropriate, and as pre-determined by the instructor.

Some (or perhaps all) classes will be recorded for student's reviewing, for Departmental evaluations and for other teaching purposes.

Please let the instructor know right away if you have any issues with class recordings.

Policy on Exams & Quizzes:

Make sure you **read & understand the "rules" and consequences of academic misconduct** (see below).

Policy on Grading *etc*

Dr Martins will determine all final grades. Your final grade is based on your actual total score. Grade Distribution: Final Exam (25%), Mid-Terms (25%), Project (25%), Homework (25%)

You have one week from receiving a grade to appeal.

Academic (Mis)Conduct

Cheating will not be tolerated. We all know what that means, so I am not going to list all the possible "dos & donts". However here are a few pointers:

Quizzes & Exams are to be completed **alone** (*not with the help of your neighbors and classmates*)

A note on academic integrity:

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. You can check the UMBC tutorial on academic integrity at https://gradschool.umbc.edu/students/integrity/.

The consequences of misconduct will be severe, and may be reported to the Academic Conduct Committee. See also the UMBC Graduate School website on policies (https://gradschool.umbc.edu/students/policies/).
If you are uncertain as to whether something is allowed: ASK FIRST!!

Phys 722 Calendar - Spring 2021

Jan 26	**First Day of Classes**
Feb 8	**Last day to Change/Drop Classes**
TBD	**Mid-Term Exam**
March 14-21	**Spring Break**
TBD	**Invited Lecture**
April 06	**Deadline to withdraw from class**
May TBD	**Project Presentations**
May 12	**Last Day of Classes**
May 14-20	**Final Exams**

Students are expected to be familiar with the Policies & Expectations of this course, and all UMBC regulations.