AOS 441: Satellite and Radar Meteorology
Spring 2018 Syllabus

Instructor

Prof. Tristan L'Ecuyer
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Office Hours: I am happy to answer questions immediately following class or by appointment

Course Websites: Learn@UW https://learnuw.wisc.edu
http://lecuyergroup.wisc.edu/~tristan/aos441.php
(username: aos441; password: gobadgers)

Lab Blog: http://aos441s18.blogspot.com/

Teaching Assistant

Mr. Andrew Dzambo
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Office Hours: Wed. 12-1pm (AOSS 1411)

Schedule

Lectures:	Wed/Fri	11-11:50 (AOSS 1411)
Lab:	Monday	11-12:50 (AOSS 1411)

Course Overview

This course will provide an overview of basic principles of radar meteorology and satellite remote sensing. Through a combination of classroom instruction and hands-on computer exercises, students will learn to apply basic radiative transfer theory to identify the 'finger-prints' of weather-related phenomena in measurements from satellite and ground-based instruments. Principles of radar operation, design and implementation of satellite missions, interpretation of imagery across a range of electronic-magnetic frequencies from the ultra-violet to microwave, and basic retrieval of atmospheric variables from active and passive systems will be discussed.

Assessment

Labs	50%
Quizzes	20%
Blog Comments/Posts	20%
Real-time Forecasting Exercise	10%

Lab exercises will be undertaken individually unless directed otherwise and will be submitted in an online blog format approximately one week after the lab has concluded. Students may have an opportunity to revise their posts in response to instructor's comments for partial credit. All lab materials can be found on the computers in Rm. 1411. Missed labs can be made up on your own

time for full credit provided results are posted by the assigned deadline. Extensions may be granted when justified but only with prior approval of the instructor.

Each lab will be accompanied by a *deeper learning* exercise consisting of one or two problems designed to explore the relevant concepts in greater depth. Unless otherwise stated, answers to these problems should be turned in separately in class on the lab due date and will be worth 30% of the lab grade. Late problems will lose 20% for each day late, and will not be accepted after solutions have been discussed in class.

Exchanging ideas and group discussion is strongly encouraged in this class. To foster such interaction, 20% of your grade will be based on making independent insightful comments on your peers' blog posts (one point per comment). Posting original material such as links to interesting radar or satellite-related news stories or imagery from high-impact events is also highly encouraged. Given the additional work required to create a novel new post, each such post will count as 3 comments.

Students are strongly encouraged to review previous lecture materials before each class. Approximately once a week a concept question will be posed that is related to material covered in recent lectures for group discussion. Participation in this discussion is strongly encouraged to complete grasp of key concepts. To further consolidate material, five short quizzes centering on these core concepts will be scheduled during the semester constituting 20% of the final grade. Separate make up quizzes may be arranged to accommodate justified absences from class

Reference Materials

There is no required textbook for the course but Ronald Rinehart provides an excellent overview of the radar material in *Radar for Meteorologists*, 5th Ed. Many students have found this to be a useful reference in the past so if there is sufficient interest, a group order will be placed during the first week of classes (cost is around $35). A copy will also be place on reserve at the Schwerdtfeger Library. The following references may also be useful and will be placed on reserve at the library:

Radar

1. Bringi, V. N. and V. Chandrasekar, 2001: *Polarimetric Doppler Weather Radar: Principles and Applications*, Cambridge University Press.
2. Doviak, Richard J. and Dušan S. Zrnić, 1993: *Doppler Radar and Weather Observations,* 2nd Ed, Academic Press.
3. Meischner, Peter (Ed.), 2004: *Weather Radar: Principles and Advanced Applications*, Springer-Verlag.

Satellite

4. Petty, G. W., 2004: *A First Course in Atmospheric Radiation*, Sundog Publishing.
5. Kidder, S. and T. Vonder Haar, 1995: *Satellite Meteorology: An Introduction*, Academic Press.
6. Stephens, G. L., 1994: *Remote Sensing of the Lower Atmosphere: An Introduction*, Oxford University Press.