

Course Syllabus

Spring 2010

ECE/METR 5683: Weather Radar Applications

- Instructor:** Prof. Phillip Chilson (chilson@ou.edu)
Office: NWC 4618, 325-5095
Office Hours: Contact me about scheduling a time or simply come by whenever my door is open
- Time:** MWF, 15:00-15:50
- Location:** NWC 5930
- Required Text:** *Doppler Radar and Weather Observations, 2nd Ed*,
R. J. Doviak and D. S. Zrnic, 1993
- Recommended Text:** *Severe and Hazardous Weather, 2nd Ed*,
(for ECE students) R. M. Rauber, J. E. Walsh, and D. J. Charlevoix, 2005
- References:** *Radar Meteorology*, Henri Sauvageot, 1992
Radar Observations of the Atmosphere, Louis J. Battan, 1973
Radar Meteorology, S. Raghavan, 2003
Weather Radar, Peter Meischner (Ed), 2004
Radar in Meteorology, D. Atlas (Ed), 1990
Radar and Atmospheric Science,
R. M. Wakimoto and R. C. Srivastava (Ed), 2003

Course Information

Overview: A variety of methods will be presented and discussed to assist the student in identifying meteorological structures using weather radars and related instruments. An introduction to the interactions of electromagnetic waves in a geophysical medium will be given. In particular, scatter from hydrometeors and refractive index variations will be explored. The course covers such topics as quantitative precipitation estimation and wind retrieval methods, fuzzy logic tools for radar data processing, and phased array applications. Current and archived data from NEXRAD and surface stations will be processed using various visualization and analysis tools. Students will also be introduced to the treatment of clear-air radar echoes and the retrieval of winds under non-precipitating conditions.

Class Homepage

The class home page will be administered through Desire2Learn

<https://learn.ou.edu/>

Materials and announcements will be posted on the **combined page**

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It is important that you check the web page regularly for new class material, postings, and other course related information.

Assignments

Homework: Several *calculation-based* homework will be assigned during the course of the semester. These are considered voluntary since they will not be collected or graded. However, the two in-class exams will be based in part on the problems presented in the homework. Solutions will be provided but you are encouraged to first attempt to work through the assignments on your own or in groups.

Modules: Three to four *programming-based* modules will be assigned. These modules will focus on real-world applications and require data analysis completed using software such as MATLAB or Python. For some exercises, it will be necessary to complete part of the assignment using MATLAB. For each module you will be asked to process the data, present and explain results, and provide any code used during the exercise.

Exams: There will be two in-class exams during semester: a mid-term and a final. The exams will be closed book; however, you will be allowed to bring one sheet of notes. The notes should be hand written and solutions to homework problems are not allowed on the sheet.

Project: In addition to the homework and modules, you will complete a research project and make an oral presentation during the end of the semester as part of a team. Teams will consist of 3 to 4 members. A self-contained written report with references will be part of the project. More description of the project will be provided during the semester.

All assignments must be submitted on time in order to receive full credit. Note that some assignments may be due during “dead week.”

Grading

Modules:	20%
Mid-Term Exam:	20%
Project:	40%
Final-Term Exam:	20%

Policies / Administrative

Academic Honesty: Homework assignments are important for your understanding of the material. Occasional help from a classmate is fine but be sure that you actually understand the material. It will help tremendously for you to come visit me in my office hours. Realize that simply copying a homework assignment from any source is considered cheating and will definitely not help your understanding. If caught, such activity could result in a failing grade in the course and possible disciplinary action. All students are expected to be familiar with and abide by the OU Academic Misconduct Code. Information on this code and other student policies is located at <http://studentconduct.ou.edu/>.

Reasonable Accommodation Policy: The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the professor as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166, phone 405-325-3852 or fax only 405-325-4173.