

ASEN 5245 – Radar and Remote Sensing

Syllabus, Spring 2018

Class Lectures:	Pre-recorded and available via class web page
Class Discussion:	Thursdays, 5:00 – 6:30 pm, Humanities (HUMN) 1B80
Office Hours:	Thursdays, 6:30 – 7:30 pm, Humanities (HUMN) 1B80 Tuesdays, 3:30 – 5:00 pm, ECNT 422 (and by appointment)
Web page:	Canvas (https://canvas.colorado.edu)
Instructor:	Christopher R. Williams
Phone:	303-497-3829 (it is better to contact me via email)
Email:	christopher.williams@colorado.edu

Outline

The subject of radars is extremely broad and this course will introduce radar systems using three interconnected perspectives: theory, radar knowledge, and dissemination and application. The theory portion will consist of the operation of radar systems. The analysis portion will consist of processing and interpreting real radar observations from ground-based, airborne, and spaceborne platforms. This perspective applies acquired theoretical knowledge to solve real-life atmospheric science problems. Finally, the synthesis portion will consist of simulating key attributes of radar systems to solidify the understanding between radar theory and application.

Course Objective

This course will introduce radar systems from a combined theoretical and applied perspective. Students will develop a quantitative understanding of radar system design and radar signal analysis, and apply these principles to specific applications in environmental remote sensing.

The subject of radars is extremely broad, and a wide range of topics will be treated in this course. It is unlikely that any student will be prepared for all topics, but the particular expertise of individual students will be cultivated through a semester project on a particular radar application. The course is intended for any graduate student with a solid background in mathematics, familiarity with electromagnetic waves and wave propagation, and a background in undergraduate signal analysis.

The applications of radar are endless from the detection of targets such as aircraft to the estimation of parameters such as refractivity, wind speed, temperature, rainfall rate, raindrop size

and the list goes on. The purpose of this class is to provide you with a fundamental understanding about how radar systems operate, their components, and their applications to environmental remote sensing.

By the end of the semester you will have a good understanding of how a radar system works and their application to environmental remote sensing. You will NOT be an expert in radar design, or construction, nor will you be able to go into Radio-Shack and buy the parts to construct your own backyard radar or a radar jammer so that you can avoid speeding tickets. Just a caveat here – It

Course Content

Virtual Access to Thursday Evening Class

On-line virtual access to the Thursday evening class is available to remote students via Zoom, a live video conferencing service administered through the University of Colorado. The Zoom meeting ID for ASEN 5245 is: **618393858**. Here is how to connect to the Zoom meeting ID:

- Join via web browser: _____
- Join via Zoom app (using meeting ID): 618393858

philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127. Information about the OIEC, the above referenced policies, and the campus resources available to assist individuals regarding sexual misconduct, discrimination, harassment or related retaliation can be found at the OIEC website.

Honor Code

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the academic integrity policy. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from the faculty member. Additional information regarding the academic integrity policy can be found at the Honor Code Office website.

Other Policies

Please be respectful of others during class time. This includes turning off your cell phone before class and not talking during class unless you have the floor. Details about all of the university policies can be found on the web at <http://www.colorado.edu/policies/index.htm>.