

**Satellite and Radar Meteorology
EAS 4460 (3 Credit Hours)
Spring 2021**

*****This is a hybrid course*****

Meeting Times: 9:30 – 10:45 AM TR

Location: ES&T L1118 or Online via Bluejeans Meetings

Course Prerequisites:

- Physics 2212
- Math 24X3 or 2X52

Instructor

Dr. Zachary Handlos

Office: 1251 Ford ES&T Building

Email: zachary.handlos@eas.gatech.edu

Office Hours: TBD or by appointment

*****Statement about Wearing Masks*****

Masks ARE REQUIRED on campus. There are no exceptions to this policy (unless otherwise discussed with the course instructor). Please contact the course instructor if you have any issues regarding access to a mask or regarding this policy.

*****COVID-19 Statement*****

If you are experiencing a fever (i.e., temperature over 100°F), cold-like symptoms, sore throat, dry cough, flu or any other type of illness, **DO NOT COME TO CLASS IN-PERSON.** Please inform the course instructor ASAP if you will miss class due to illness.

Please complete the following daily COVID-19 checklist every day prior to attending ANY class in-person: https://health.gatech.edu/sites/default/files/images/daily_checklist.pdf

If you said “yes” to any of the checklist items, stay home or get off of campus ASAP.

If you test positive for COVID-19 and/or have COVID-19-like symptoms, please read the “If you Get Sick” section at this link here, and follow ALL directions:

<http://health.gatech.edu/coronavirus/campus-guidelines>

Textbooks (not required but strongly recommended)

1. Rauber, Robert M., and Stephen W. Nesbitt. *Radar Meteorology: A First Course*, John Wiley & Sons, Incorporated, 2018.
2. Kidder, Stanley Q. and Thomas H. Vonder Haar. *Satellite Meteorology: An Introduction*, Academic Press Limited, 1995.

Course Description

The invention and implementation of satellite and radar technologies during the mid- to late-20th century is arguably the most important revolution to meteorologists' ability to observe Earth's atmosphere. Satellites have provided us the opportunity to observe regions in real-time that are difficult for humans to establish surface weather station instrumentation, such as the oceans and remote land regions. Radars have helped improve our ability to “nowcast” significant weather events and inform the public of severe and hazardous weather with enough warning time to prepare for destructive consequences. As meteorologist students yourselves, there is no doubt that you have used this type of technology at some point in your undergraduate career and will continue to do so beyond this course.

The goal of this course is to learn about how satellites and radars “work” and to apply these technologies to observing (and even forecasting) hazardous atmospheric phenomena. This will be accomplished by tailoring the material of this course around a combination of theory and a series of “case study” events with emphasis on the application of these technologies.

Earth and Atmospheric Science Core Skill Development

The School of Earth and Atmospheric Sciences at Georgia Tech strives to meet several learning standards for all students within the undergraduate program. These standards, and how they will be achieved in this course, are listed below:

- 1) Demonstrate **quantitative understanding** of satellite and radar meteorology theory
- 2) Develop **critical analysis** and **problem-solving skills** through course exercises
- 3) Gain **practical experience** with **analyzing, interpreting and communicating** meteorological phenomena through the use of satellite and radar imagery
- 4) Gain appreciation of the **interdisciplinary** nature of atmospheric science through satellite and radar applications
- 5) **Increase breadth of knowledge** within the context of satellite and radar meteorology

Grading

Your grade in this course will be based on your performance within the following categories:

- Quizzes (5 quizzes; keep top 4) and Practice Quizzes – 30% of grade
- Research Paper Project – 20% of grade
- Weather Discussions and Blog – 20% of grade
- Problem Sets – 25% of grade
- WxChallenge Forecasting and Reflection – 5% of grade

Quizzes (30% of Grade)

Quizzes will assess your understanding of recently discussed course material. Your lowest quiz grade will be dropped. The actual quizzes make up 25% of your total grade, while “practice

quizzes” make up 5% of your total grade. Due to the drop policy, there will be no makeup quizzes; a missed quiz will result in a "0" score and be considered your "dropped" quiz.

Research Paper Project (20% of Grade)

You will write a scientific paper within the context of satellite and radar meteorology that focuses on either 1) a case study of a weather event or 2) is an extensive literature review. You will also give a presentation to the class summarizing your findings in a presentation format analogous to that of presenting at a conference. Your paper and presentation will be expected to follow AMS paper and presentation guidelines (more on this during class).

Weather Discussions and Blog (20% of grade)

You and one or more classmates will facilitate a weather discussion during 2 of the lab periods this semester. This weather discussion will require you to provide an in-depth analysis of the current (and recent past) weather as well as short-term forecasted weather using satellite and radar tools and theory from this course. This will allow you an opportunity to practice applying course material to weather observational analysis and forecasting.

You and your classmates will also contribute weather forecast discussions to the course blog. More details about the blog post assignments will be revealed in class.

Problem Sets (25% of Grade)

You will be assigned problem sets that will require you to solve problems and/or analyze data within the context of satellite and radar meteorology.

WxChallenge Forecasting and Reflection (5% of grade)

You will participate within the WxChallenge forecasting competition this semester. This is a national forecasting competition, where participants enter maximum/minimum temperature, maximum wind speed and precipitation values for a forecast city over a two-week period. Prizes are awarded for forecasters that receive the least number of error points.

In this course, you will be required to submit forecasts for all forecasting days for all dates within this semester. At the completion of each two-week period (i.e., completion of each forecast city), you will write a short reflection paper summarizing how well you did at forecasting, including discussion of your forecast strategies and how well they worked (or did not work).

Grading Scale

Grade	Percentage
A	100 – 90
B	89.99 – 80
C	79.99 – 70
D	69.99 – 60
F	<60

Depending on the distribution of student scores at the end of the course, the scores may be curved to reflect the scale described above (up to the instructor’s discretion).

Late Work Policy and Makeup Assignments

An assignment turned in late will be deducted 20% of its total grade for each day it is late after submitted. This policy will only be waived in extreme circumstances (e.g., serious illness, family emergency, COVID-19). You must contact me at least 24 hours prior to the due date of any assignment if you anticipate any issues with submitting it on time.

Lecture Notes

I will post all lecture notes/slides from class, the course syllabus and other relevant course information/resources on the course website. This includes any recorded lectures.

Extra Credit

In fairness to all students, *I typically do not offer extra credit* (unless otherwise specified).

Cheating

Cheating will not be tolerated in this course. Cheating includes the following: 1) copying answers from another student, 2) using unauthorized resources to study for course quizzes, which includes the use of electronic devices, 3) posting solutions to course quizzes and assessments on the Internet, and/or 4) any other activity that would be considered “academic misconduct”.

To summarize, do not cheat; it is not worth jeopardizing your future because you wanted to look good doing something that you need to improve upon.

Academic Honor Code

The instructor and students are expected to abide by Georgia Tech’s Academic Honor Code. Plagiarism of any kind (including the reproduction of materials found on the internet) is strictly prohibited and will be reported to the Office of Dean of Students for academic misconduct. The complete text of the Academic Honor Code may be found at:

<https://policylibrary.gatech.edu/student-affairs/academic-honor-code>

Access and Accommodations:

If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Office of Disability Services to explore reasonable accommodations.

The Office of Disability Services can be contacted by:

Phone: **404-894-2563**

Email: dsinfo@gatech.edu

Website: <https://disabilityservices.gatech.edu/>

Resources:

Academic Support

- [Center for Academic Success](#)
 - [1-to-1 tutoring](#)
 - [Peer-Led Undergraduate Study \(PLUS\)](#)
 - [Academic coaching](#)
- Residence Life's [Learning Assistance Program](#)
- [OMED Educational Services](#) - Group study sessions and tutoring programs

- [Communication Center](#) - Individualized help with writing and multimedia projects
- [Academic advisors](#) for your major

Personal Support

Georgia Tech Resources

- The [Office of the Dean of Students](#) | 404-894-6367 | 2nd floor, Smithgall Student Services Building; You also may request assistance [here](#)
- [Counseling Center](#) | 404-894-2575 | Smithgall Student Services Building 2nd floor
 - Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention.
 - *Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at 404-894-2204.*
- [Students' Temporary Assistance and Resources \(STAR\)](#)
 - Can assist with interview clothing, food, and housing needs.
- [Stamps Health Services](#) | 404-894-1420
- [OMED Educational Services](#) | 404-894-3959
- [Women's Resource Center](#) | 404-385-0230
- [LGBTQIA Resource Center](#) | 404 385 4780
- [Veteran's Resource Center](#) | 404-385-2067
- [Georgia Tech Police](#) | 404-894-2500

National Resources

- The [National Suicide Prevention Lifeline](#) | 1-800-273-8255
 - Free and confidential support 24/7 to those in suicidal or emotional distress
- The [Trevor Project](#)
 - Crisis intervention and suicide prevention support to members of the LGBTQ+ community and their friends
 - Telephone | 1-866-488-7386 | 24 hours a day, 7 days a week
 - [Online chat](#) | 24 hours a day, 7 days a week
 - Text message | Text "START" to 687687 | 24hrs day, 7 days a week