

**EAS 2750 or PHYS 2750: Physics of the Weather – Fall 2026**

**Section: A**

**Number of Credits: 3**

**Course Instructor**

Dr. Zachary Handlos

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**Course Description**

You have experienced many weather events and the changing seasons throughout your life. In this class we will focus on the basic physical and dynamical principles driving meteorological phenomena on a variety of space and time scales. This includes (but is certainly not limited to): Earth's seasons, climate differences between locations, thunderstorms (including severe weather hazards), hurricanes, extratropical cyclones, precipitation types and more mundane phenomena such as non-precipitating clouds, fog, prevailing wind directions, and even clear skies.

You will apply scientific principles to develop an understanding of meteorological phenomena through learning meteorological theory and analysis of “real” data. This includes analyzing time series and observational data, forecast data (both from Numerical Weather Prediction models as well as Artificial Intelligence/Machine Learning-driven forecasting), weather maps, and sounding data.

**Course Learning Outcomes**

Our goal is to develop the following scientific skills below in the context of course material:

- 1) Understand the basic physical principles of atmospheric science
- 2) Demonstrate understanding of “why” and “how” meteorological phenomena develop
- 3) Access, analyze and physically interpret meteorological data
- 4) Apply your understanding of meteorology towards critically analyzing data and drawing conclusions supported by physically accurate scientific evidence.

**Recommended (but not required) Texts**

- 1) Ahrens, D.C. (2016), Meteorology Today, 12<sup>th</sup> edition, Cengage Learning; ISBN-13: 9781337616669.
- 2) Stull, R. B. (2017), Practical Meteorology: An Algebra-based Survey of Atmospheric Science, Univ. of British Columbia; ISBN-13: 9780888651761. URL: [https://www.eoas.ubc.ca/books/Practical\\_Meteorology/](https://www.eoas.ubc.ca/books/Practical_Meteorology/)

**Grading Policy**

The grade for this course will be determined as follows:

- Attendance – 15%
- Participation and Practice Problems – 15%
- Weather Briefing – 10%
- Knowledge Checks – 40%
- Course Project – 20%

### Description of Graded Components

- Attendance – You are required to attend every class period. If you are unable to attend class due to an excused absence, please notify the course instructor or TA 24 hours prior to the start of class or ASAP if the reason for an absence emerges the day of class.
- Participation and Practice Problems – In-class activities will range from practice knowledge check problems to individual or collaborative activities focused on analyzing weather data, discussing course theory, and investigating other relevant weather and climate applications. Such assignments will be graded based on completion rather than accuracy. Participation will also include competing within the WxChallenge national forecasting competition.
- Weather Briefing – Starting a couple of weeks into the semester, students will take turns individually or in pairs starting off each class with a 5-minute maximum weather briefing. Students will be required to share a weather forecast of either Atlanta, GA or the WxChallenge forecast city of interest.
- Course Project – Throughout the course, students will make steady progress toward investigating meteorological data extracted from local or statewide resources or from an archived extreme weather event of interest. The goal of this project is to acquire data, read the data into Python, MATLAB, Excel, or an equivalent computer programming language/data analysis tool, analyze the data and create figures that provide meaningful insight into one or more meteorological aspects of interest. The key deliverables from this project will be the following:
  - Making the data accessible to the class
  - Providing a summary in writing, GitHub, Jupyter Notebook, etc...of how all figures of interest were made
  - Presentation to class about projectMore information about this project will be discussed throughout the semester.
- Knowledge Checks – Rather than have exams in this course, students will be required to complete a series of “knowledge checks,” which will assess student understanding of course material. Students will have two attempts on each knowledge check, with the second attempt allowing for partial credit back from the first attempt.

### Grading Scale

The final course grade will be based on the final grade percentage calculated based on the assignment and assessment weighting described earlier within this syllabus, with the following percentage ranges associated with each letter grade:

- A: 89.5% or greater
- B: 79.5 – 89.49%
- C: 69.5 – 79.49%
- D: 59.5 – 69.49%
- F: Less than 59.5%

For any students completing this course as a pass/fail grade, a “passing” final grade constitutes a final grade percentage of 69.5% or higher (i.e., a minimum “C” letter grade).

### **Attendance Policy**

You are required to attend every class period. If you are unable to attend class due to an excused absence, please notify the course instructor or TA 24 hours prior to the start of class or ASAP if the reason for an absence emerges the day of class.

### **Academic Integrity**

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

### **Accommodations for Students with Disabilities**

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

### **Student-Faculty Expectations Agreement**

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

### **Other Course Procedures & Policies**

**Communication:** Communication regarding anything and everything related to this class will utilize Canvas announcements and messages. Please make sure that your Canvas messaging/announcements is linked to your Georgia Tech email account or that you are frequently checking your Canvas messages and the Canvas page. **It is your responsibility to read all messages, including ALL message content.**

**Late Policy:** No late assignments will be accepted with respect to any lecture attendance, participation, or quizzes. Exceptions will apply (due to ANY illness, family emergency, or other emergency matters) **with communication of at least 24 hours in advance of assignment due date.**

**Extra Credit:** In fairness to all students, no extra credit will be offered unless otherwise specified by the course instructor within lecture. Extra credit opportunities in lab will be communicated to you by the lab coordinator and/or your TA's.

**Artificial Intelligence:** We now live in a world where AI is everywhere, and it is very convenient to use for a lot of day-to-day applications. This also includes looking up answers to

questions for courses as well as assisting (or fully writing) answers or papers on written assignments. Here is a breakdown of when AI is authorized vs. unauthorized in this course, noting that **any unauthorized use of AI is a violation of the Georgia Tech Academic Honor Code**:

When AI is **authorized** in this course:

- Participation and practice problems
- Assisting with note taking during lecture
- Producing figures and code for the course project provided that all AI prompt information and output are provided when submitting final course project deliverables

When AI is **unauthorized** in this course:

- Knowledge Checks – this includes both attempts for each knowledge check assessment

### **Undergraduate Student Academic Success Resources**

A list of resources for undergraduate students' academic success and information about advising can be found at [Success at Tech](#).

Academic Support: Academic Success and Advising (a unit in the Office of Undergraduate Education & Student Success) provides free support for your courses. Students can attend scheduled supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack. To explore what options work best for you, please visit us online at [success.gatech.edu/tutoring](https://success.gatech.edu/tutoring), email us at [tutoring@gatech.edu](mailto:tutoring@gatech.edu), or come see us at Clough Undergraduate Learning Commons, Suite 283.

### **Student Well-Being**

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A comprehensive list of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being (<https://students.gatech.edu/student-resource-guide>).

More resources on supporting student well-being on the syllabus and beyond are available through the [Learning Well Initiative](#).