Physics of the Weather
EAS 2750 (3 credit hours)
Fall 2019

Course Meeting Times: 9:05 – 9:55 AM MWF
Course Location: Room L1175 ES&T

Course Instructors
Dr. Zachary Handlos
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Office Hours: 3-4 PM MTWR or by appointment

Dr. Greg Huey
Office: 1168 Ford ES&T Building
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Office Hours: 1:30 – 3 PM WF or by appointment

Course TA
Yunle Chen
Office: 3310 Ford ES&T Building
Email: ychen737@gatech.edu
Office Hours: 4 – 5:30 PM MW or by appointment

Required Text
1) Simmons, K. M. and D. Sutter (2012), Deadly Season – Analyzing the 2011 Tornado Outbreaks; ISBN-13: 978-1-878220-25-7.

Recommended Texts
1) Ahrens, D.C. (2016), Meteorology Today, 12th 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. **FREE PDF COPY OF CHAPTERS ON T-SQUARE**
   URL: https://www.eoas.ubc.ca/books/Practical_Meteorology/

Course Description
You have likely experienced a variety of weather events in your lifetime. However, do you know "how" and "why" such weather phenomena occur? The goal of this course is to help you understand, both qualitatively and quantitatively, how such events come about. This includes (but is certainly not limited to) thunderstorms, tornadoes, hurricanes, winter storms, blizzards, hail, lightning, and even less threatening (but equally exciting) phenomena such as non-precipitating clouds, fog, wind and clear skies!

In this course, you will be trained to "think like a scientist" and develop an understanding of meteorological phenomena through learning meteorological theory, critical analysis of data and application of material. This semester, we will do this in the context of a few select extreme weather events that have impacted the United States, applying the scientific method to help us question, understand and evaluate the evolution of these phenomena using an algebra-based approach.

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

1) Demonstrate understanding of "why" and "how" atmospheric science phenomena develop
2) Be able to pose questions that can be scientifically tested/explored
3) Identify and/or develop hypotheses that can be tested using atmospheric science observational and/or modeling data
4) Access, analyze and physically interpret atmospheric science data
5) Apply your understanding of meteorology towards critically analyzing data and drawing conclusions supported by physically accurate scientific evidence.
6) Communicate climate science information orally and through writing at a level comparable to that of atmospheric scientists and professionals

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

- In-Class Participation – 15% of grade
- Group Weather Discussion – 5% of grade
- Deadly Season – Reading and Assignments – 10% of grade
- Either:
    - 4 Module Exams (17.5% each) and Cumulative Final Exam Dropped – 70% of grade

      OR

    - 3 Module Exams (15% each) with lowest exam dropped and Cumulative Final Exam (25%) – 70% of grade

In-Class Participation (15% of grade)
<u>You are expected to attend every class period.</u> In-class participation activities will be assigned and are expected to be completed by the end of the class period or as otherwise specified.

Your final participation grade will be out of 100 points. There will be more than 100 points of participation available this semester; once you have reached the 100 point limit, you will have maximized this portion of your grade. As a result, no participation "make-up" assignments will be allowed.

Group Weather Discussion (5% of grade)
On Fridays, a small group of students will lead the class in a short 10 minute discussion of relevant current and forecasted weather. This will give students a chance to gain experience communicating weather analysis and forecasting information in front of an audience. More details about this assignment will be revealed during the semester.

Deadly Season Reading Assignments (10% of grade)
As a class, we will be reading along to the book "Deadly Season – Analysis of the 2011 Tornado Outbreaks." As posted on the course schedule, there will be questions for you to answer for each chapter of the book and are due via online Canvas submission by the start of class on their due date. We will have one class period near the end of the semester where we have a book discussion.

Module Exams (70% of grade OR 45% of grade if cumulative final exam included)
There will be 4 module exams (each at the end of each course module). These module exams are non-cumulative and only cover the module topics discussed prior to exam dissemination. The lowest module exam grade will be dropped if your cumulative final exam score improves your grade (see "Cumulative Final Exam" below for details).

Cumulative Final Exam (25% of grade if included)
A final exam will be administered during the course final examination period; see course schedule for date and time of final exam. This final exam will be cumulative, assessing your understanding of course material from each module. Questions will be structured similarly to questions from each module exam.

The cumulative final exam will be dropped if the score on this exam does not improve your module exam average score. As a result, your exam grade in this class will be based on either your 4 module exam scores without the final exam included OR your top 3 module exams plus the final exam (see grading section above for details).

Grading Scale
The **grading** for the course is as follows:

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
NO LATE ASSIGNMENTS are allowed in this course. Any late work will be graded as a "0". All assignments must be completed and turned in to me ON TIME. Makeup assignments will only be allowed in extreme circumstances (e.g., serious illness, family emergency). **You must contact us at least 24 hours prior to the due date/assessment date and explain in full your request for a makeup assignment to be eligible to turn in an assignment beyond its due date.**

If you get sick and have to miss class, you must provide us with documentation from the school (e.g., Dean's note) that confirms you missed class for medical reasons.

Lecture Notes
We will post relevant lecture notes/slides from class, the course syllabus and other relevant course information/resources on the course website. This is not an excuse to skip class, as **your participation grade depends upon your attendance!**

Extra Credit
In fairness to all students, *We do not guarantee extra credit in this course 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 and assessments, 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".

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
At Georgia Tech, we strive to make learning experiences as accessible as possible. 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: http://disabilityservices.gatech.edu/

If our class meets at a campus location: Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Course Schedule
The course schedule is available on the course Canvas website. Please consult this schedule for all course due dates and other key relevant information. *The course schedule is subject to change at the instructors' discretion.*