

GEOGRAPHY 1900
Extreme Weather and Climate
Fall Semester 2019

Instructor: **Jim DeGrand**

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Lab Instructor: **Jami Orrell**

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Office Hours: Mondays and Wednesdays, 1:00 – 1:45 pm **OR by appointment**

Course Meeting Times/Places

Lecture: Tuesday, Thursday; 5:30 PM to 6:50 PM; Hopkins Hall 250

Labs:

Section: 201 (19200) - Tuesday, 7:05 – 8:25 PM in Derby Hall (DB) 0070 (Jerry Zou)

Section: 202 (19201) - Thursday, 7:05 – 8:25 PM in Derby Hall (DB) 0070 (Jerry Zou)

Course Materials

Text: Aguado, E. and J. E. Burt, 2012. Understanding Weather and Climate, 7th edition.

Pearson Education, Inc. Upper Saddle River, NJ. (ISBN: 9780321769633) ***(Strongly suggested)***

Lab Manual: Course packet distributed by UniPrint at <http://uniprint.osu.edu>, available at OSU Bookstores (at Central Classroom and South Campus Gateway Barnes & Noble) ***(Required)***

The Carmen course management system <https://carmen.osu.edu>

The PackBack online community: <https://Packback.co/questions>

The TopHat interactive classroom platform: <https://tophat.com>

Course Description

The objective of this course is to introduce students to the study of the atmosphere and the processes governing its behavior. We will cover a variety of topics in meteorology, including the structure and behavior of the atmosphere, global energy balance and transfer, atmospheric circulation, precipitation processes, weather systems and severe weather. This course will emphasize the interactions between the atmosphere, hydrosphere, biosphere and lithosphere and

will illustrate how the movement of matter and energy between these “spheres” is responsible for the weather, climate and environments we experience on Earth.

Science GEC Course

Natural Science coursework fosters students’ understanding of the principles, theories, and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world. Listed below are the 4 outcomes of the Natural Science GEC courses and how this course will achieve them:

1. Students understand the basic facts, principles, theories and methods of modern science.
 - a Lectures reading and exams will provide students with opportunities to learn about and the basic facts, principles and theories of meteorology and climatology
 - b Labs will demonstrate and give hands on experience with basic methods, and reinforce understanding of principles with experiments
2. Students learn key events in the history of science.
 - a References will be made in lecture to the progression of our understanding of the atmosphere over time from both meteorological and climatological perspectives
3. Students provide examples of the inter-dependence of scientific and technological developments.
 - a Lab exercises will reinforce how technology infuses understanding, and how instrumentation to measure atmospheric phenomena has changed over time
 - b Lectures and Readings will highlight specific examples of how technology has enhanced theoretical understanding and vice versa.
4. Students discuss social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.
 - a Through lectures and readings about climate change and severe weather students will engage with the social implications of scientific discovery and the range of social responses to environmental hazards.

Student Evaluation

Participation (14%):

Attendance: 2% of your grade will be based on whether you show up for class. I will check attendance at each class meeting using TopHat. It is your responsibility to make sure your device works with this program. If you are unfamiliar with TopHat please see <https://resourcecenter.odee.osu.edu/top-hat>. Policies regarding absences are set forth below.

TopHat questions during lecture: 3% of your grade will be based on your response to multiple choice questions presented in class via TopHat. Note that you will receive full credit for participating even if your answer is incorrect.

Packback: 9% of your grade will be based on participation in the course Packback community. This is an online service that promotes discussion and critical thinking about course content. You

will have to purchase a subscription to this service for US \$25.00. This can be done online or at the University Bookstore. Participation will be measured weekly. For full grade on this aspect of participation you will be required to send in one question and answer two questions per week on the platform. Submitted questions and answers will be evaluated and those deemed of sufficient quality will count for full grade. This will be determined by the sum of the “curiosity points” generated by your submission. Each question/answer can generate a maximum of 100 points. For full credit a minimum of 125/300 “curiosity points” is required per week. Activity starts on the second week of class. No submissions will be required during Thanksgiving week (November 25-29). The last submissions should be made on the week ending on Sun, December 8. Weekly submissions are due by 11:59 PM on Sundays. My goal with Packback is to have students think about and interact with the course content in other ways than preparation for exams. I hope the effort to construct questions and respond to the questions and comments of your fellow students lead you to think critically about what is presented in class. I also hope the activity results in opportunities for students to link class material to other information pertinent to their personal interests and/or other courses.

To start posting on Packback:

1. Navigate to <https://Packback.co/questions> and click “Register as a new student”. Note: If you already have an account on Packback you can login with your credentials.
2. Make sure to register with your OSU email address and real first name and last name. Enter our class community’s access code into the “Join a new Community” module on your dashboard. Our community access code is:
1977beb8-9555-4b4a-88e3-2cdc9061c0bf
3. Follow the instructions on your screen to finish your registration.

For more details on the Packback participation activity, including examples of suitable questions/answers check Community Guideline page:

<https://blog.packback.co/2013/03/05/packback-questions-community-guidelines/>

For a brief introduction to Packback Questions and why we are using it in class, watch this video: <https://vimeo.com/packback/welcome-to-packback-questions> Any questions regarding the platform can be directed to holla@packback.co.

Labs (35%):

Laboratory exercises will be conducted during the lab periods. Attendance is required. Students should read through each lab and be prepared **PRIOR** to the lab session. It is the responsibility of each student to turn in the required laboratory exercise at the beginning of class on the due date. All lab exercises must be completed **INDIVIDUALLY**, although working in groups is encouraged.

Exams (3 @ 17% each):

There will be three exams (two midterms and a final). Material presented in lecture and/or lab is fair game for the exams. Exams, including the final, are mostly non-cumulative but questions about some important themes/concepts will be present in more than one exam. These

themes/concepts will be clearly communicated to the class prior to exams. Make-up exams are only allowed in the event of a documented emergency or through **PRIOR** consent of the instructor. All exams will take place in the regular lecture room. Midterm exams occur during regular lecture hours and the final exam will take place in the regular lecture room on **Wednesday, December 11, from 8:00 to 9:45 PM.**

Extra Credit

There are 4 ways to earn extra credit in this course. If you did all of them you could earn as much as 7% of the total points available in the course. In other words, if your course score was 82% but you did all of the extra credit, your grade would be based on a score of 82% plus 7% or 89%. The four extra credit opportunities are:

1. **(1%) Complete the syllabus quiz on Carmen.** A perfect score results in 1% added to your course grade. There are no partial scores for this quiz – it's all or nothing. The quiz must be completed by August 30, 2019.
2. **(3%) The G1900 Weather Creative.** Create and submit a piece of art related in some way to the content of the course. Here are the guidelines for this project:
 - a. You may work alone or you may collaborate with up to 2 other classmates.
 - b. The form of your creation is open: it can be poetry, prose, music, dance, photography, painting, sculpture, etc.
 - c. Your submission must be made by Friday, November 29th
 - d. A representation of the work must be uploaded to Carmen. This is not a problem if your submission is written. If your submission is visual or performance based then an image or a video will be required.
 - e. Video or audio submissions should have a duration no longer than 2 ½ minutes.
 - f. Submissions which, by their nature do not include written words, must be accompanied by a brief (<100 words) statement as to how the submission relates to the course.
 - g. Submissions deemed (by me) to be of sufficiently quality will be submitted to the class for a vote during the next to last class meeting. Top vote getters will win prizes
 - h. The prizes are not guaranteed to be life-changing
3. **(3%) Citizen Science participation.** I will offer up to 3% extra credit points to students who regularly participate in atmospheric science related citizen science programs throughout the semester. Extra credit points awarded will be pro-rated by student participation in the program. For example, a student who participates regularly in a program for 8 of the 16 weeks in the semester would get an extra 1.5% of the total points available in the course added to their final score. There are 3 programs that I would be willing to give credit for:
 - a. “CoCoRaHS”: The Community Collaborative Rain, Hail and Snow network (www.cocorahs.org). In this program volunteers setup a rain gauge on their property and post daily observations of precipitation receipts.
 - b. “S’Cool”: Students’ Cloud Observations On-line (<http://scool.larc.nasa.gov/rover.html>). In this project volunteers make daily observations of clouds which are uploaded to a NASA website and used in ground validation of satellite based estimations of cloud type and cloud coverage.

- c. State Climate Office of Ohio (SCOO) FARM app (<https://farm.bpcrc.osu.edu/>). SCOO has created an app to help Ohio farmers comply with regulations regarding the application the application of manure and liquid fertilizer to fields. You can help us evaluate the app by defining a field to monitor and then recording the precipitation forecast and the actual precipitation received at that site during the semester.
4. **(1%) TopHat extra credit.** Students who answer 80% or more of the TopHat questions presented during lecture and who get at least 50% of these right will receive 1% extra credit toward the final grade. Questions missed due to an excused absence (see below) will not be included in this accounting.

Attendance, late work, make-up exams, etc

I expect you to attend all lectures and remain in the classroom for the duration of the lecture. Missing class will likely result in a reduction in participation points and poorer scores on exams. I will keep track of attendance through the use of TopHat quizzes administered at the end of each class meeting. Each student gets one unexcused absence; all other unexcused absences will figure into the calculation of the participation grade.

You may be enrolled in a course which schedules exams outside of its class meeting times (the Math Department frequently does this). It is your responsibility to make sure that you are not scheduled to take an exam for another course during the time this class meets. If this occurs, you must seek an alternative time for your exam. Missing this class so you may attend some function in another class will not be excused.

Each out of class assignment (e.g. the PackBack assignments) will be associated with a due date and time. Any assignment received after this time will be considered late. Late submissions incur an immediate reduction of 10% from the score of the assignment. This penalty increases 10% per additional day the assignment is late.

Absences and late work will not be penalized in the case of excused absences. Excused absences include: participation in a scheduled activity of an official University organization, verifiable confining illness, verifiable family emergencies, subpoenas, jury duty, and military service. If you miss an assignment deadline for any of these reasons, you must provide me with verifiable documentation (a note from your University organization, a doctor's note, etc.). The documentation must include a name and a telephone number for someone who can explain your absence.

I concur with the statements on OSU's Student Health Service's website that most illnesses (colds, dizziness, headaches, nausea, etc) that keep students out of the classroom do not require an office visit or medical treatment. Instead, these conditions are typically best treated through self-care. In recognition of this, I will accept the Student Health Service's Absence Excuse Form, available at <https://shs.osu.edu/appointments/absence-excuse/> as the beginning of a dialog to determine whether an absence due to illness is to be excused.

If you miss an assignment deadline, and you can provide valid documentation, I will give you an extra 24 hours to complete the assignment. After 24 hours, the original late penalty procedure is restarted.

If you miss a midterm exam or the final exam, and you can provide valid documentation which explains your absence (as above), the make-up exam must be written within one week (seven days) of the originally scheduled exam. If you do not write the missed exam within the seven day grace period, you will receive no grade (i.e., 0%) for it.

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct webpage (<https://trustees.osu.edu/index.php?q=rules/code-of-student-conduct/>).

Disability Services

Students with disabilities that have been certified by the Office for Disability Services (098 Baker Hall 113 W. 12th Ave, telephone 292-3307) will be appropriately accommodated, and should inform the instructor of their needs at the **beginning of the term**.

Classroom etiquette

Without exception, we will observe the following policies which are designed to maximize learning opportunities for all students:

1. Except when participating in class activities such as the TopHat quizzes, the use of cell phones, smart phones and other mobile devices during class is prohibited. Please turn them down or off before class begins. If I perceive that you are using a cell phone during class or if your cell phone rings, I will ask you to leave the class for the remainder of the period.
2. Laptops or tablet computers are permitted in class solely for the purpose of taking notes. If I perceive that you are using your device to surf the web, check your email, etc during class I will ask you to leave the room for the remainder of the class period.
3. I welcome your participation during class in the form of questions regarding the course material. I insist that all such interactions be conducted in a manner that is not disrupting to the class and is respectful to me and to your peers. If your conduct in class is disrupting or disrespectful I will ask you to leave the class and we will have a conference about your continued enrollment in the course.

Schedule*

Week	Dates		Topic	Readings
1	20-Aug	22-Aug	Atmospheric composition	Chap 1
2	27-Aug	29-Aug	Energy, Radiation and Seasons	Chap 2
3	03-Sep	05-Sep	Energy Balance, Temperature	Chap 3
4	10-Sep	12-Sep	Pressure and Wind	Chap 4
5	17-Sep	19-Sep	Review, Exam I	
6	24-Sep	26-Sep	Atmospheric Moisture	Chap 5
7	01-Oct	03-Oct	Cloud formation, Precipitation	Chap 6, 7
8	08-Oct	10-Oct	Atmospheric Circulation	Chap 8
9	15-Oct	17-Oct	Air Masses and Fronts	Chap 9
10	22-Oct	24-Oct	Review, Exam II	
11	29-Oct	31-Oct	Midlatitude Cyclones	Chap 10
12	05-Nov	07-Nov	Severe thunderstorms	Chap 11
13	12-Nov	14-Nov	Tropical Storms and Hurricanes	Chap 12
14	19-Nov	21-Nov	Climate and Climate Change	Chap 15, 16
15	26-Nov	28-Nov	Air Pollution	Chap 14
16	03-Dec		Review	
17	11-Dec		Final Exam: Wednesday, 8:00 - 9:45 pm	

Green dates = exams

Red dates = no class meeting

*This is a tentative schedule. The exam dates will not change. The material covered by each exam will be determined by what we have been able to cover in lecture. The scope of each exam will be clearly defined and communicated to the class by the instructor during the review session prior to each exam.