

GEOGRAPHY 1900
Extreme Weather and Climate
Fall Semester 2018

Instructor: **Jim DeGrand**

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Office Hours: Tuesdays and Thursdays, 4:00-5:00 PM **OR by appointment**

Lab Instructor: **Jerry Zou**

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Office Hours: Tuesdays, 2:00 – 4:00 pm **OR by appointment**

Course Meeting Times/Places

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

Labs:

Section: 201 (8157) - Tuesday, 7:05 – 8:25 PM in Derby Hall (DB) 0070 (Jerry Zou)

Section: 202 (8158) - 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) (**Required**)

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 <http://carmen.osu.edu>

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. The goals of the GEC courses are:

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students learn key events in the history of science.
3. Students provide examples of the inter-dependence of scientific and technological developments.
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.

All of these goals will be addressed through the assigned readings and lectures

Student Evaluation

Labs: 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: 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 12, from 8:00 to 9:45 PM.**

Final grade determined as follows:

Lab:	35%
Midterm Exam 1:	21%
Midterm Exam 2:	22%
Final Exam:	22%

Extra Credit

I will offer extra credit points to students who regularly participate in atmospheric science related citizen science programs throughout the semester. I am prepared to award up to 6% of total points to students who participate in an approved programs. 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 3% of the total points available in the course added to their final score. There are 4 programs that I would be willing to give credit for:

1. “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.

2. “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.
3. Hurricane image classification (<https://www.cyclonecenter.org/>). In this project volunteers contribute to the creation of a climatology of tropical storms by classifying satellite images of hurricanes and cyclones. For this project 1 extra credit point will be awarded for every 20 images classified, up to a maximum of 120 images.
4. 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.

There are probably other programs I would consider if they are related to atmospheric science and require regular volunteer participation. However, under no circumstances will I award extra credit for participation in a program without my prior approval of the program.

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. The use of cell phones, smart phones and other mobile devices during class is prohibited. Please turn them 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	21-Aug	23-Aug Atmospheric composition	Chap 1
2	28-Aug	30-Aug Energy, Radiation and Seasons	Chap 2
3	04-Sep	06-Sep Energy Balance, Temperature	Chap 3
4	11-Sep	13-Sep Pressure and Wind	Chap 4
5	18-Sep	20-Sep Review, Exam I	
6	25-Sep	27-Sep Atmospheric Moisture	Chap 5
7	02-Oct	04-Oct Cloud formation, Precipitation	Chap 6, 7
8	09-Oct	11-Oct Atmospheric Circulation	Chap 8
9	16-Oct	18-Oct Air Masses and Fronts	Chap 9
10	23-Oct	25-Oct Review, Exam II	
11	30-Oct	01-Nov Midlatitude Cyclones	Chap 10
12	06-Nov	08-Nov Severe thunderstorms	Chap 11
13	13-Nov	15-Nov Tropical Storms and Hurricanes	Chap 12
14	20-Nov	22-Nov Climate and Climate Change	Chap 15, 16
15	27-Nov	29-Nov Air Pollution	Chap 14
16	04-Dec	Review	
17	12-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.