GEOGRAPHY 1900
Extreme Weather and Climate
Fall Semester 2020

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

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

Course Meeting Times/Places
Lecture: (Class 15689, Section 200) Tuesday, Thursday; 5:30 PM to 6:50 PM; Lazenby Hall 021

Labs:
(Class 15690, Section: 201) - Tuesday, 7:05 – 8:55 PM in Derby Hall (DB) 0070 (Rebecca Chapman)
(Class 15691, Section 202) - Thursday, 7:05 – 8:55 PM in Derby Hall (DB) 0070 (Rebecca Chapman)

Course Materials
The textbook and/or courseware for this course is being provided via CarmenBooks. Through CarmenBooks, students obtain publisher materials electronically through CarmenCanvas. The fee for this material is included as part of tuition and is listed as *CarmenBooks fee* on your Statement of Account. The materials provided through CarmenBooks are available immediately on or before the first day of class.

Unless you choose to opt-out of the program, you do NOT need to purchase any materials for this course at the bookstore. For more information on the program or information on how to opt out, please visit the CarmenBooks website.

The materials you will be using in this course are:

Text: Aguado, E. and J. E. Burt, 2012. Understanding Weather and Climate, 7th edition. Pearson Education, Inc. Upper Saddle River, NJ. (ISBN: 9780321769633)

Courseware: Mastering Meteorology (available through and integrated into our Carmen course site)

Lab Manual: The individual lab assignments will be made available to you as fillable pdf files on Carmen

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. Discussions in class, readings and course assignments 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 readings and class discussions 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. Class discussions 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 class discussions 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.

Impact of COVID-19 on this course

The COVID-19 global pandemic has materially altered how every class at Ohio State will be conducted in the Fall of 2020. Below is a summary of the impacts of the pandemic on the structure of this course.

1. Social distancing guidelines mean that only half the class can fit in the lecture room at one time and that only half of a lab section can fit in the lab classroom at one time. Instead of the whole class meeting every Tuesday and Thursday, the lecture periods will be restricted to those students whose labs meet on the same day. So, if you are signed up for the Tuesday evening lab, Tuesday is your day to attend the lecture session. Students in the Thursday lab will attend lecture on Thursdays. Each lab section will be divided into cohorts A and B. These cohorts will meet on alternate weeks. See the schedule on Carmen for details on which cohorts will meet in a particular week.
2. The uncertain future trajectory of the pandemic in Ohio requires us to be ready for in-person instruction to be discontinued at any time during the semester as it was in the Spring of 2020. In view of this I have opted to design this semester's course so student success is much less dependent on attendance in class/lab and more dependent on completion of on-line learning tasks. With this structure, the course will accommodate those students who may become ill, who may have to quarantine themselves or who are legitimately concerned about exposure to a potentially lethal illness for which there is, at present, no cure.
3. I do not plan to use the lecture sessions as the primary vehicle for introducing students to course material. Instead, students will be introduced to course concepts through material assigned on-line. These concepts will be reinforced through a series of weekly assignments. We will use our time together in class to work on the assignments and discuss how the assigned reading relates to contemporary meteorological and climatological conditions. I intend to spend a few minutes at the end of every lecture session outdoors observing the weather and relating these observations to course content.
4. The experiments we normally conduct in the lab portion of this course generally require multiple (6 – 8) students to work closely together. That is not possible under the social distancing guidelines. Accordingly, we will not be asking students to conduct these experiments during the lab sessions. Instead, we will make available videos of the lab experiments recorded by the lab instructors. By following along with these videos, students will be able to record the data produced in the experiment and complete the lab assignment as though they had conducted the experiments themselves. Since we will not be using the lab sessions to conduct experiments, these sessions will function more like recitations: Ms. Chapman will be available during these sessions to assist students in completing their lab assignments. She will not be there to oversee the conduct of the actual experiments.
5. When you attend a lecture or lab session:
    a. I ask that you sit in the same seat each time. Both the lecture and lab classrooms have been configured for seating with social distancing in mind. Please sit in one of the seats that has been designated as available.
    b. We will record attendance in both the lecture and lab sessions. This is solely for the purpose of contact tracing should that become necessary. Attendance will not be counted as part of the course grade.

c. I require you to wear a mask. This is not negotiable. If you forget to bring one, we may have extras for you to use but I cannot guarantee these will always be available. **Please remember: under no circumstances will we admit you into the classroom without a mask**.

Student Evaluation

All assignments will be administered and graded through Carmen. There will be no in-class labs, assignments or exams.

Syllabus quiz (1%):

Your first assignment is a quiz based on your reading of this syllabus. Please read through all of the material in this module and then take the quiz at the end. **The quiz must be completed by Friday, 8/28/2020**.

Reading quizzes (24%):

A quiz will be due each Monday covering the assigned readings for the week. You should read the material beforehand and then attempt the quiz. These quizzes will be short (10-15 questions), mostly multiple choice questions aimed at determining if you have read the material. They will be timed (15 minutes) and they will be open book.

On-line assignments (40%):

There will be a series of more in-depth assignments due each Friday. These assignments will be based largely on readings of the course textbook and will be drawn from material made available via the courseware, Mastering Meteorology, available on Carmen, which accompanies our text. You should at least review the assignment before coming to the lecture session. We will devote time in each lecture session to a discussion of the questions for that week's assignment. For both parts of the weekly assignments there will a substantial penalty for any work turned in late without an excuse (see below under Late Work).

***Labs (35%)*:**

As mentioned above, the lab component on the course will be undertaken through a set of videos in which lab instructors conduct the experiment and the student follows along and records the relevant data. Videos will be posted weekly and the completed labs will be due the following week (see lab schedule). As with the weekly Carmen assignments described above, there will be a deduction for labs turned in late. The lab instructor will be available for consultation both during the in-person lab sessions and during her on-line office hours. If it turns out that you have to miss a lab due date because you wish to consult with the lab instructor during your assigned lab period, you will be allowed to submit the completed lab on the next due date without the late penalty applied.

Exams

There will be no exams in this course.

Extra Credit

There are 2 ways to earn extra credit in this course. If you did both of them you could earn as much as 6% of the total points available in the course. In other words, if your course score was 82% and you did both extra credit projects, your grade would be based on a score of 82% plus 6% or 88%. The extra credit opportunities are:

1. **(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 27th
    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 (less than 100 words) statement as to how the submission relates to the course.
    g. Submissions will be made available for review by the entire class in the last week of November. Students in the class will be able to indicate their favorite submissions via an anonymous Carmen poll. Top vote getters will win prizes.
    h. The prizes are <u>not</u> guaranteed to be life-changing
2. **(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. The period over which participation will be evaluated is 8/31 through 11/29 (90 days). The number of points awarded will be pro-rated by student participation in the program. For example, a student who reports 65 cloud observations for the S'Cool program (described below) would receive 72.2% (65/90) of the 3 extra credit points available or 2.16 points.

    There are 2 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 set up 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.

    Students will have to provide evidence (e.g. a screenshot of a summary the number of reports made uploaded to Carmen) of how many daily observations you have made no later than 12/4 to receive the credit available.

Attendance

This will likely be an odd semester for us all in that both students and instructors are likely to experience significant difficulties attending class in person. Anyone receiving a positive diagnosis for the 'Rona will necessarily be in quarantine for 2 weeks, regardless of whether they are suffering any debilitating effects of the disease. In addition, you may have to quarantine just because of exposure to someone who has contracted the virus. On top of this, I think we have to accept that it is likely we will not make it through the semester before the University decides to pull the plug on all in-person instruction at the Columbus campus. For these reasons I have decided to make attendance at in-person lectures and at the lab sessions optional. While I will take attendance at each class session this is just in case we need to do contact tracing and will not be used in the calculation of your grade. This doesn't mean that there is no value to attending the lecture. These sessions will be useful as you work to complete your weekly assignments plus I intend to use these sessions to connect the material you encounter in your textbook and on Carmen with what is actually happening outside the classroom in today's weather and climate. The lecture sessions will be informal and I hope they will be useful, informative and, (dare I say it?) fun!

Late work

Late work will not be penalized if you have a valid excuse. Valid reasons for turning work in late 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. Please note that I will not regard having to quarantine due to exposure to COVID-19 as valid excuse for late work.

If you miss an assignment deadline, and you can provide valid documentation, you will have 24 hours following the period during which you were absent/incapacitated to complete the assignment. After 24 hours, the original late penalty procedure is restarted.

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

As mentioned above, lecture sessions are likely to be quite informal. We will devote some time each week to a discussion of current weather and climate events, especially as they relate to that week's readings. The bulk of time in the lecture sessions will be devoted to working on the weekly assignments through interactions with me and with your classmates. We will end each class session by going outside and observing the weather from the ground-level as people have been doing for thousands of years. This informality notwithstanding, I expect all interactions between persons in the class to be conducted with respect. Any student whose conduct is disruptive or disrespectful will be asked to leave and will be placing continued enrollment in the course in jeopardy.

Schedule*

Week	Dates		Topic	Readings	Lab
1	25-Aug	27-Aug	Course introduction		
2	1-Sep	3-Sep	Atmospheric composition	Chap 1	1
3	8-Sep	10-Sep	Energy, Radiation and Seasons	Chap 2	
4	15-Sep	17-Sep	Energy Balance, Temperature	Chap 3	2
5	22-Sep	24-Sep	Pressure and Wind	Chap 4	3
6	29-Sep	1-Oct	Atmospheric Moisture	Chap 5	4
7	6-Oct	8-Oct	Clouds	Chap 6	5
8	13-Oct	15-Oct	Precipitation	Chap 7	6
9	20-Oct	22-Oct	Atmospheric Circulation	Chap 8	7
10	27-Oct	29-Oct	Air Masses and Fronts	Chap 9	8
11	3-Nov	5-Nov	Midlatitude Cyclones	Chap 10	9
12	10-Nov	12-Nov	Severe thunderstorms	Chap 11	
13	17-Nov	19-Nov	Tropical Storms and Hurricanes	Chap 12	10
14	24-Nov	**26-Nov**	Human impact on the atmosphere	Chap 14	
15	**1-Dec**	**3-Dec**	Climate change	Chap 16	

Red dates = holiday: no class meeting

Green dates = no in-person class meetings