

GEOGRAPHY 1900
Extreme Weather and Climate
Autumn Semester 2018

Instructor:

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Office Hours: Fridays, 11:30 AM to 1:30 PM OR by appointment

Course Details

Lecture: Monday, Wednesday and Friday, 12:40 to 1:35 PM Jennings Hall (JE) 001

Labs: Monday, 9:35– 10:55 AM in Derby Hall (DB) 0070 – Mary Grace

Monday, 2:20– 3:40 PM in Derby Hall (DB) 0070 - Mary Grace

Wednesday, 9:35– 10:55 AM in Derby Hall (DB) 0070 - Gabriel

Wednesday 2:20– 3:40 PM in Derby Hall (DB) 0070 - Jeffrey

Friday 9:35– 10:55 AM in Derby Hall (DB) 0070 – Gabriel

Friday 11:10– 12:30 AM in Derby Hall (DB) 0070 – Jeffrey

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) **(Suggested)**

Lab Manual: Course packet distributed by UniPrint at <http://uniprint.osu.edu>, available at Barnes & Noble – The OSU Bookstore at Gateway/15th & High **(Required)**

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

Course Description

This course will serve as an introduction to the study of the atmosphere. The primary objective is to provide students with a comprehensive understanding of the atmosphere and the processes that govern its behavior. In this course students will be exposed to various aspects of 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 inter-relationship existing 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. Below are the four general Natural Science GE outcomes and how each will be addressed by the course.

1. Students understand the basic facts, principles, theories and methods of modern science.
 - a. Lectures, textbook and exams for basic facts, principles and theories
 - 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. Progressive understanding of atmospheric dynamics will be explained using key examples like mid-latitude cyclones.
 - b. Basic history of meteorology and history of our understanding of anthropogenic climate change is explicitly covered by lectures.
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. Measurements of the atmosphere, its qualities and motions are key to atmospheric science, and 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. In lectures and readings about climate change, ozone destruction, and atmospheric pollution students will engage with the social implications of science discoveries and how these both mold and are molded by worldviews and political perspectives.

Student Evaluation

Participation:

Attendance. One third (5 of the total 15 points) of the participation grade will be passed on lecture attendance. Each student is entitled to one unjustified absence during the semester.

Packback. The other two thirds (10 points) will be based your activity in Packback. You will have to purchase a subscription to this service for U\$ 25.00. 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 answer will be gauged 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 19-23). The last submissions should be made on the week ending on Sat, December 8. Submissions are accepted until Sunday 11:59 PM of the previous week.

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 elaborate questions and respond to classmates’ doubts lead students to think critically about what is being discussed 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 Questions:

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: **C466F003-7902-11D7-D9E0-2875E8FAFA53**

Follow the instructions on your screen to finish your registration.

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: vimeo.com/packback/Welcome-to-Packback-Questions

Any questions regarding the platform can be directed to holla@packback.co.

Labs: Laboratory exercises will be conducted during recitations. 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 the lab class on the due date. All lab exercises must be completed **INDIVIDUALLY**, although working in groups is encouraged.

Exams: There will be three 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 at the regular lecture room. Midterm exams occur during regular lecture hours and the final exam will take place in the regular lecture room on Thursday, Dec 13 from 2:00 to 3:45 PM. All exams, including the final, will consist exclusively of multiple choice questions.

Final Grade Break Up

| | | |
|----------------------------|-----|--------|
| Participation - Attendance | 5% | |
| Participation - Packback | 10% | |
| Labs | 30% | |
| Midterm Exam 1 | 15% | 21-Sep |
| Midterm Exam 2 | 20% | 24-Oct |
| Final Exam | 20% | 13-Dec |

Extra Credit

Two distinct activities will provide students with the opportunity of earning up to 5 extra points on their final course grade.

Syllabus test: There is the potential for 1 extra credit point on the final course grade for those who turn in a perfect syllabus test. The test is available on Carmen and should be submitted online via Carmen by the end of the day on Wednesday, September 5. There will be no partial grades. To get the 1 extra credit point all responses must be correct. One error = no extra credit. Even those that hand in a perfect syllabus test can lose the 1 point at any time during the semester if they ask one of the instructors a question that could be answered with information present on the syllabus. The syllabus test can be turned in up to one week late for 70% of the total grade.

Citizen science cloud observations: In this individual effort, up to 4 extra credit points on the final course grade will be awarded to students who act as observers for the “Student Cloud Observations Online (S’COOL)” project. This is a NASA led citizen science initiative aimed at collecting cloud cover data in order to improve satellite-based observations. The amount of extra credit received will be determined by the total number of reports handed in. Each report is worth 0.08 points. These are accumulated until 4 extra credit points are obtained (50 reports). Students are encouraged to perform more than 50 observations, but those who do will still receive the maximum 4 extra credit points. To be valid, reports must be based on observations performed between August 22 and December 5. For full credit reports must be submitted to Carmen by December 5, the last day of classes. More details on how to perform observations and complete reports are found on the Extra Credit section in Carmen.

Special Statement Regarding Absences

Based on the Office of the Provost recommendations on the current flu situation, students that feel ill are encouraged to stay home and isolate themselves from others. In addition, the “Explanatory Statement for Absence from Class” self-reporting form available online (<https://shs.osu.edu/posts/documents/absence-excuse-form2.pdf>) from the Wilce Student Health Center will be accepted as documentation of medical absence and reasonable efforts will be made to provide for make-up work opportunities. All make-ups from documented absences must be **completed within one week** of the original scheduled date.

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 (http://studentaffairs.osu.edu/resource_csc.asp).

Disability Services

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue

Lecture Schedule*

| Lecture** | Chapter | Theme |
|----------------------------|---------|-------------------------------|
| 1 | 1 | Atmosphere Composition |
| 2 | 1/2 | Comp. of the Atm./Radiation |
| 3 | 2 | Radiation in the Atmosphere |
| 4 | 2/3 | Seasons/Energy Balance |
| 5 | 3 | Temperature |
| Sep 21⁺ | | First Exam |
| 6 | 4 | Pressure and Wind |
| 7 | 4/5 | Pressure and Wind /Moisture |
| 8 | 5/6 | Moisture / Cloud Formation |
| 9 | 7 | Precipitation Processes |
| 10 | 8 | Atmospheric Circulation |
| 11 | 8/9 | Air Masses and Fronts |
| Oct 24⁺ | | Second Exam |
| 12 | 10 | Mid Latitude Cyclones |
| 13 | 11 | Tornadoes |
| 14 | 12 | Tropical Cyclones |
| 15 | 15/16 | Climate and Climate Change |
| 16 | 15/16 | Climate and Climate Change |
| 17 | 14 | Atmospheric Pollution |
| Dec 13⁺⁺ | | Final - 2:00 - 3:45 PM |

*This is a tentative schedule. While exam dates will not change, the actual material presented in lectures at the time of any exam might not mirror the schedule precisely. The material covered in each exam will be clearly defined and communicated to the class by the instructor.

**Lecture here means a cohesive presentation covering a whole theme, not a 55-minute class.

⁺ Midterms take place during regular class times in the regular lecture room

⁺⁺ Final exam takes place in the regular lecture room