**GEOGRAPHY 1900**

**Extreme Weather and Climate**

**Spring Semester 2021**

***Instructor:***
Alvaro Montenegro
*Office:* 1152 Derby Hall (DB)
*Phone:* 614-688-5451
*Email:* montenegro.8@osu.edu - **preferred**
*Office Hours, only via Zoom*: Mondays, Tuesday, Wednesdays and Thursdays from 11:00 to 12:00; OR by appointment.

Zoom link and password for Alvaro's office hours:

https://osu.zoom.us/j/6467349450?pwd=bjM5dVBxd3BRcXBTOFMwSjdoVFZTZz09

Meeting ID: 646 734 9450

Password: 473878

***Teaching Assistants:***

Emilio Mateo
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*Office Hours, only via Zoom:* Wednesday from 10:00 to 12:00 AM OR by appointment

*Office:* DB 1155
*Email*: chapman.751@osu.edu
*Office Hours, only via Zoom:* Tuesdays from 2:00 to 4:00 PM OR by appointment

Josh Steiner
*Email* steiner.273@buckeyemail.osu.edu
*Office Hours, only via Zoom:* Fridays from 10:00 AM to 12:00 PM OR by appointment

**All office hours will be conducted via zoom.**

**Course Details**

*Lecture:* All lecture content will be delivered remotely by videos available on BuckeyeBox.

https://osu.box.com/s/9o62lzn7dicmrkfs05ld7okn83d96ugi

*Labs:* Lab work will be based on recorded experiment demonstrations available online. Links to the video demonstrations can be found in each lab assignment on Carmen. Students will be capable of completing all lab work remotely, but in person assistance with the labs will be available through recitations that will take place during the originally scheduled lab periods. The schedule below refers to these recitations. Interested students can but are NOT required to attend recitations. Recitations will be conducted by teaching assistants. The main goal of the recitations is to deal with lab-related questions and clarifications. If time is still available after lab questions, TA's will address eventual doubts regarding lecture content. Given class size limitations, any particular student will be able to attend recitations every other week, meaning each lab session will be divided in two groups. Each TA will make the composition of each group available to their lab sessions.

Please start your lab activities by reading the information found on the submodule "Virtual Lab Procedures and TA into" found in the "Labs" module on Carmen.

Monday, 11:10 AM– 12:30 PM in Derby Hall (DB) 0070 – Emilio
Monday, 2:20– 3:40 PM in Derby Hall (DB) 0070 – Emilio
Wednesday, 11:10 AM– 12:30 PM in Derby Hall (DB) 0070 – Rebecca
Wednesday 12:45– 2:05 PM in Derby Hall (DB) 0070 – Rebecca
Friday 11:10 AM– 12:30 PM in Derby Hall (DB) 0070 – Josh
Friday 2:20– 3:40 PM in Derby Hall (DB) 0070 – Josh

**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*: Made available online as labs progress.

*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.

***Lectures***

All lecture material is available on this BuckeyeBox link:
https://osu.box.com/s/9o62lzn7dicmrkfs05ld7okn83d96ugi
Content is broken down into "Lectures". Each lecture covers a fairly large amount of content and is comprised of several video files or "Modules". Modules tend to be somewhere between 20-50 minutes long and will be uploaded to BuckeyBox as the semester progresses. In attempt to help students navigate through the many Module files, the following file name convention is used:
Lec#_Mod# _ShortDescriptionOfContent.m4v

For example:
*Lec1_Mod2_AtmStructure.m4v*
Is the file containing the first lecture's second module dealing with the structure of the atmosphere.

A second category of video files will deal with what I call "housekeeping" issues. These contain information about administrative issues, not content. I will use these files to introduce myself to the class, send out reminders about exams, clarify eventual doubts about dates and procedures, etc…Housekeeping files will are also available on the same BuckeyBox where lecture videos are kept and follow the naming convention:
Hk#_ShortDescriptionOfTheme.m4v
For example:
*Hk1_Introduction.m4v*
Contains an introduction to the course, including much of the information found on this syllabus.

**Student Evaluation**

***Participation (12% of final grade, or 12 grade points)*:**

Meet the instructor online. Earn 2 participation points by meeting the lecture instructor (Alvaro Montenegro) via Zoom at least once. The meeting can take place during any regularly scheduled office hour or by appointment. Remember that Alvaro is available for office hours from Monday through Thursday between 11:00-12:00 AM. During the meeting students must, in addition to introducing themselves, ask a question or require further explanation on themes related to the course content. At the time of the meeting the instructor will let the student know if the interaction merited the 2 participation points. There will be no partial points for this. Meetings will either result in 2 points being earned or in the need for a second meeting.

To schedule a meeting with the instructor, go to Carmen Calendar and click on the "Find Appointment" button on the right-hand side of the page.

PackBack. 10 of the total 12 participation points will be based your activity in Packback. You will have to purchase a subscription to this service for U$ 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 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.

The first submission is due on Jan 31 and weekly submissions continue for every Sunday up to an including Sunday, April 11. This results in a total of 11 submissions. Submissions are accepted until Sunday 11:59 PM.

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.

How to Register on Packback:

An email invitation will be sent to you from help@packback.co prompting you to finish registration. If you don't receive an email (be sure to check your spam), you may register by following the instructions below:

1. Create an account by navigating to https://questions.packback.co and clicking “Sign up for an Account”
   Note: If you already have an account on Packback you can log in with your credentials.

2. Then enter our class community’s lookup key into the “Looking to join a community you don't see here?” section in Packback at the bottom of the homepage.

Community Lookup Key: c6364b1f-202b-4587-9d3b-a8eb1831bca1

Follow the instructions on your screen to finish your registration.

Packback requires a paid subscription of $ 25.00 per semester. Refer to www.packback.co/product/pricing for more information.

How to Get Help from the Packback Team:

If you have any questions or concerns about Packback throughout the semester, please read their FAQ at help.packback.co. If you need more help, contact their customer support team directly at help@packback.co.

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

***Labs*:**

- Labs
  - Laboratory exercises will be based on recorded demonstrations (and sometimes also data) available online.
  - Lab demonstrations (and occasional data sets) will be available online by Sunday evening a particular week with lab reports due on 11:59 PM on Friday of that week. For example, demonstrations posted online by Sunday Jan 17, will be due on 11:59 PM of Friday of that week, Jan 22.
  - It is the responsibility of each student to turn in the required laboratory exercise at specified due date and time. All lab exercises must be completed **INDIVIDUALLY**, although working in groups is encouraged.

- Teaching Assistants are the ones responsible for the Labs. While the instructor will be happy to help with particular lab questions, different TA's might grade things differently and it is always safer to settle lab doubts with TAs.
- Students should also approach the TA's when it comes to arrangements on late or missed labs.

- Recitations:
  - Students will have the option to attend in person recitations conducted by TAs.
  - Students are not required to attend recitations.
  - Recitations follow the same schedule as regular labs, BUT class occupancy restrictions related to the Covid pandemic result in students only being able to attend once recitation every two weeks. Students from each lab session will be divided into two groups. Only one group will be allowed to attend a particular's week recitation. Each TA will make the composition of each group available to their lab sessions.

***Exams*:**

Content for all exams is based on lecture material.

Weekly Online Quizzes. 28% of the final grade will be based 12 weekly, open-book online quizzes related to lecture material. The goal of the quizzes is to help students pace their lecture video watching. No quizzes are due on weeks when we hold an exam.

- Unless otherwise noted, online quizzes will be due on Fridays at 11:59 PM. Quizzes will be available on Carmen for a period of at least 48 hours prior to their due time.
- Most quizzes will be comprised of 10 questions, but this number might change by a couple of questions in some cases.
- While quizzes are open book, there will be a strict time limit for their completion. Expect about 70-90 seconds per question.
- The preamble will provide information on duration and material covered by each quiz. Students should use this information to prepare for the quiz prior to starting it.
- Once students start taking a quiz they cannot stop to return to it later.
- Students will only have one chance to take each quiz.
- All quizzes have the same weight (2.8% of final grade). The two lowest quiz grades will be dropped. This means that the overall quiz grade will be based on the best 10 quiz submissions for each student. (10*2.8=28 points)

- The first quiz will be due on Friday, Jan 22 and the last quiz will be due on Friday, Apr 16.

Midterm and Final. Both will have identical length and format and are also worth the same. The final is mostly non-cumulative but questions about some important themes/concepts will be present in both exams. These themes/concepts will be clearly communicated to the class by a study guide prior to exams. Both exams will be online and open book.

Both Midterm and Final will be comprised of 50 questions with 35 being multiple choice and 15 true or false. Both have the same 90-minute duration meaning students will have on average 1.8 minutes, or 108 seconds to answer each question. That being said, the time limit refers to the whole exam, there will be no time limit on individual questions.

Both exams will be available on Carmen.

The Miderm will have to be completed on Carmen sometime between 8:00 AM and 8:PM on Friday, Mar 5.

The Final Exam will have to be completed on Carmen sometime between 8:00 AM of Thursday, Apr 22 and 8:00 PM of Friday, Apr 23.

Students will be able to start taking these exams at any time during the periods described above, but once they start, they will have only 90 minutes to finish. To make use of all 90 minutes, students need to start taking the exams at or before 6:30 PM of the day the exam is due. Reinforcing with an example: If a student starts to take the Midterm exam at 7:55 PM on Mar 5, they will only have five (5) minutes to answer all 50 questions before they get locked out of the exam by Carmen. If this takes place. students will not have a second chance to answer any questions left blank.

Missed quizzes and exams

Make-up exams and quizzes are only allowed in the case of university sanctioned absences, a documented emergency or through **PRIOR** consent of the instructor.

**Final Grade Break Up**

| | | |
|---|---|---|
| Part. – Meet the Instructor | 2% | |
| Part. - Packback | 10% | |
| Labs | 30% | |
| Weekly Quizzes | 28% | |
| Midterm Exam | 15% | Mar 5 [+] |
| Final Exam | 15% | Apr 22-23 [+] |

[+] No weekly quizzes due on Exam weeks

**IMPORTANT NOTE ON GRADES SEEN ON CARMEN**

**The overall course grade shown on Carmen will not be an accurate representation of your overall course grade!**

This is due in large part to the lack of connectivity between Carmen and Packback

To track your actual overall course grade please use the Grade Calculator spreadsheet available on Carmen.

**Extra Credit**

Students will have the opportunity of earning up to 5 extra points (or 5%) on their final course grade.

***Syllabus test (1 extra credit point):*** 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 (11:59 PM) on Friday, Jan 29. There will be no partial grades. To get the 1 extra credit point all responses must be correct. One error = no extra credit.

***Citizen science cloud observations (up to 4 extra credit points):*** 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 Jan 11 and Apr 19. Students will be able to submit up to two valid observations per day as long as they are performed more than 2 hours apart. For full credit reports must be submitted to Carmen by Apr 19. 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.

**Health and Safety Requirements**

All students, faculty and staff are required to comply with and stay up to date on all university safety and health guidance (https://safeandhealthy.osu.edu), which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses."

**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 |
| 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 |
| 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 |

*This is a tentative schedule, content and order or presentation might change during the semester.

**Lecture means a cohesive presentation covering a whole theme and is composed of multiple Modules.

**Partial list of important dates*:**

- Syllabus quiz due: Friday, Jan 29

- First Packback submission due: Sunday, Jan 31.
- Last Packback submission due: Sunday, Apr 11

- First Weekly Quiz due: Friday, Jan 22
- Last Weekly Quiz due: Friday, Apr 16.
- No Weekly Quiz due on Friday, Mar 5 (day of the Midterm).

- Midterm Exam:** Available from 8:00 AM to 8:00 PM on Friday, Mar 5.
- Final Exam:** Available from 8:00 AM on Thursday Apr 22 to 8:00 PM Friday, Apr 23.

  **Students will have 90 minutes to finish once they start taking the exams during the time windows detailed above.

- Cloud observation extra credit due: Monday, Apr 19.

*Unless otherwise noted, due time is 11:59 PM of the due date.