

**Geography 5900: Weather, Climate and Global Warming
Autumn 2019. 3 Units.**

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Instructor: Dr. Steven Quiring

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Office Hours: Monday and Wednesday, 2-3 pm and by appointment. If you are not available during my regular office hours, please feel free to contact me to setup a meeting at a time that works for you.

Teaching Assistant: Josh Steiner (steiner.273@buckeyemail.osu.edu)

Office hours: Monday and Wednesday, 11 am-noon and by appointment (1155 Derby Hall).

Lectures: Monday, Wednesday, and Friday 12:40 p.m. – 1:35 p.m., CBEC 130

Required Materials:

(1) Understanding Weather and Climate, 7th Edition (2015), Aguado & Burt, ISBN-13: 9780134113388, Pearson

Note: You can use an earlier edition of the textbook to save money, but it is **your responsibility** to resolve any discrepancy between different editions. Material will be assigned based upon the 7th edition of the textbook.

Class Website: carmen.osu.edu

Course Objectives:

This course serves as an introduction to the fundamental physical and mathematical principles governing both day-to-day weather and the average of weather, or climate, of a region. The objective is to **understand the physical processes of the earth-atmosphere system and describe its weather features and climate characteristics**. This includes the energy receipt, loss, and redistribution in the earth-atmosphere system as well as the role of atmospheric moisture, its global spatial distribution, and its importance in energy exchange, and cloud and precipitation formation.

Course lectures will describe the causes, and the spatial distribution, of climates of the world as well as the physical mechanisms of some observed weather phenomena. The physical causes of and spatial variations in small- and large-scale motions of the atmosphere will be described. The distribution and causes of 21st century climate will be explained and the distributions of past climates, methods for reconstructing them, and the potential explanations for them will be discussed. The course will also consider how human activities have both intentionally and unintentionally become a factor in the physical processes of weather and climate. Weather and climate influences almost every aspect of our personal and professional activities. A goal of this class is to help students understand how the material covered in this class is related to their fields of interest and their daily lives.

Learning Objectives:

Upon successful completion of the course, students should:

- (1) be able to describe the structure and composition of the atmosphere and how it has changed with time;
- (2) know the factors that cause solar energy variations on earth and be able to describe the global radiation balance;
- (3) be able to explain the physical processes leading to the formation of atmospheric features including clouds, precipitation, winds, and storms;
- (4) have a good understanding of the physical behavior of gases, and of the different forms of energy and their role in atmospheric motion and weather systems;
- (5) have a good understanding of environmental issues pertaining to human impacts on the climate system, including global warming;
- (6) be able to describe the spatial and temporal patterns of global temperature, and precipitation –and the physical mechanisms that are responsible for these patterns.

Grading:

Your grade will be based on five parts:

Reading Quizzes	15%
Exercises (best 7 will count)	15%
In-class quizzes and exercises	10%
Mid-term exams (2; each worth 20%)	40%
Final exam (December 12)	20%

There is a reading quiz that is due at the beginning of each week (due Monday at 12:39 pm; i.e., right before the start of class). Each quiz will be administered through Carmen and it has ~10 questions that are based on the chapter you were assigned to read. These quizzes are assigned to encourage you to keep up with reading the text book. **There are no makeups for missed reading quizzes and late submissions are not accepted.** This is an individual assignment.

The exercises will require you to apply what you learn in this class. There are 8 exercises that will be assigned during the semester. You will get credit for the best 7 scores. These are individual assignments and each student must submit their own work. However, you may discuss the questions and work collaboratively. **There are no makeup exercises and late submissions are not accepted.**

There will be a number of in-class quizzes and exercises that are worth a total of 10%. They are designed to reward those who attend class, so the dates of these in-class activities will not be announced. These activities may require you to work with your classmates to solve problems related to the theories covered in class. These are typically collaborative exercises (one submission per group).

Examinations will consist of multiple-choice questions with your answers entered on Scantron sheets.

- **Midterm 1** (Friday, September 27, in class) will test all topics covered before September 27.
- **Midterm 2** (Wednesday, October 30, in class) will test all topics covered during

October.

- **Final exam** (Thursday, December 12, 2:00-3:45 pm) will test all topics covered since Midterm 2. The final exam will be held in the same room as the lecture (CBEC 130).

*Barring extraordinary circumstances there will be no make-up exams. Written documentation will be required and verified before a make-up exam will be considered. Students must contact the instructor **prior** to any exam to be considered for a make-up exam.*

The grading scale is:

A	= 93 to 100%
A-	= 90 to 92%
B+	= 87 to 89%
B	= 83 to 86%
B-	= 80 to 82%
C+	= 77 to 79%
C	= 73 to 76%
C-	= 70 to 72%
D+	= 67 to 69%
D	= 63 to 66%
D-	= 60 to 62%
E	= <59%

Expectations of students

- Attend all classes, be on time, and actively participate in the class.
- You will be responsible for understanding all the material covered in lecture and that is part of the quizzes and exercises.
- Complete all quizzes and exercises.
- Read assigned material. Wider reading is encouraged.
- Submit exercises on time. **No late exercises will be accepted.**
- Some material that will be presented in class is not in the textbook, so make arrangements to get notes if you are absent.

Class Policies

No private conversations or newspaper reading during class will be tolerated.

All cellphones must be silent during class. Please refrain from email/texting during class.

Statement on 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 at <http://studentlife.osu.edu/csc/>.

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.

Tentative Class Schedule

*The following course schedule is a guide, and likely will change as the class evolves. **The exam dates are fixed.***

Date	Day	Class Content	Readings	Exercises	week
aug. 21	w	syllabus and intro			1
aug. 23	f	Introduction to climate change	Chapter 16		1
aug. 26	m	Climate change (The Science)	Chapter 16	Reading quiz 1	2
aug. 28	w	Climate change (The Science)	Chapter 16		2
aug. 30	f	Climate change (Future Impacts)			2
sep. 2	m	NO CLASS- Labor Day	Chapter 1	Reading quiz 2	3
sep. 4	w	Introduction to weather and climate	Chapter 1	Exercise #1 due	3
sep. 6	f	Atmospheric composition and structure	Chapter 1		3
sep. 9	m	Atmospheric composition and structure	Chapter 1		4
sep. 11	w	Forms of energy	Chapter 2	Exercise #2 due	4
sep. 13	f	Earth-Sun relationships	Chapter 2		4
sep. 16	m	Earth-Sun relationships	Chapter 2	Reading quiz 3	5
sep. 18	w	Energy balance	Chapter 3	Exercise #3 due	5
sep. 20	f	Energy balance	Chapter 3		5
sep. 23	m	Controls on temperature	Chapter 3	Reading quiz 4	6
sep. 25	w	Review for Exam #1			6
sep. 27	f	Exam #1			6
sep. 30	m	Atmospheric humidity	Chapter 5		7
oct. 2	w	Controls on humidity	Chapter 5		7
oct. 4	f	Condensation: Dew, fog, and clouds	Chapter 5		7
oct. 7	m	Dew, fog, and clouds (continued)	Chapter 5	Reading quiz 5	8
oct. 9	w	Condensation: Dew, fog, and clouds	Chapter 5	Exercise #4 due	8

oct. 11	f	NO CLASS- Fall Break			8
oct. 14	m	Stability and clouds	Chapter 6	Reading quiz 6	9
oct. 16	w	Stability and precipitation	Chapter 6		9
oct. 18	f	Precipitation	Chapter 7		9
oct. 21	m	Precipitation	Chapter 7	Reading quiz 7	10
oct. 23	w	Atmospheric pressure and winds	Chapter 4	Exercise #5 due	10
oct. 25	f	Atmospheric pressure and winds	Chapter 4		10
oct. 28	m	Atmospheric pressure and winds	Chapter 4	Reading quiz 8	11
oct. 30	w	Exam #2			11
nov. 1	f	Global systems	Chapter 8		11
nov. 4	m	Global systems	Chapter 8	Reading quiz 9	12
nov. 6	w	Air Masses & Fronts	Chapter 9		12
nov. 8	f	Air Masses & Fronts	Chapter 9		12
nov. 11	m	NO CLASS- Veterans Day	Chapter 9	Reading quiz 10	13
nov. 13	w	Mid-latitude cyclones	Chapter 10	Exercise #6 due	13
nov. 15	f	Hurricanes/Tropical Cyclones	Chapter 12		13
nov. 18	m	Hurricanes/Tropical Cyclones	Chapter 12	Reading quiz 11	14
nov. 20	w	Thunderstorms	Chapter 11	Exercise #7 due	14
nov. 22	f	Tornadoes	Chapter 11		14
nov. 25	m	Weather forecasting	Chapter 13	Reading quiz 12	15
nov. 27	w	NO CLASS- Thanksgiving			15
nov. 29	f	NO CLASS- Thanksgiving			15
dec. 2	m	Earth's climates	Chapter 15	Reading quiz 13	16
dec. 4	w	Last day of class: Review for Final Exam		Exercise #8 due	16
dec. 12	TR	Final exam (2-3:45 pm)			