

**Geography 5900: Weather, Climate and Global Warming  
Autumn 2017. 3 Units.**

**Instructor:** Dr. Steven Quiring

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**Office Hours:** Monday and Wednesday, 1-2 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:** Gabriel Zeballos Castellon ([zeballoscastellon.1@osu.edu](mailto:zeballoscastellon.1@osu.edu)); Office hours: Thursday 11-12, Friday 10-11 am and by appointment (1131 Derby Hall).

**Lectures:** Monday, Wednesday, and Friday 11:30 a.m. – 12:25 p.m., Evans Lab 2004

**Required Materials:**

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

(2) **Mastering Meteorology.** You will need an online account for Mastering Meteorology to complete the reading quizzes and online assignments.

*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](http://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 21<sup>st</sup> 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:

Mastering Meteorology: Reading Quizzes	15%
Mastering Meteorology: Exercises (best 8 will count)	15%
In-class quizzes and exercises	10%
Mid-term exams (2; each worth 20%)	40%
Final exam (December 14)	20%

There is a reading quiz that is due at the beginning of each week (due Monday at 11:15 am; i.e., right before the start of class). Each quiz will be administered through Mastering Meteorology 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 9 exercises that will be assigned during the semester. You will get credit for the best 8 scores. The exercises will be assigned using Mastering Meteorology (see Class Schedule for dates) and they are due on Wednesday. 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 assignments 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 29, in class) will test all topics covered before September 27.
- **Midterm 2** (Friday, November 3, in class) will test all topics covered during October.
- **Final exam** (Thursday, December 14, 10:00-11:45 am) will test all topics covered since Midterm 2. The final exam will be held in the same room as the lecture (Evans Lab 2004).

*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 assignments.
- Complete all assignments.
- Read assigned material. Wider reading is encouraged.
- Submit assignments on time. **No late assignments 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](mailto:slds@osu.edu); 614-292-3307;  
[slds.osu.edu](http://slds.osu.edu); 098 Baker Hall, 113 W. 12<sup>th</sup> 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	Assignments	week
aug. 23	w	syllabus and intro			1
aug. 25	f	Introduction to climate change			1
aug. 28	m	Climate change (The Science)	Chapter 16	Reading quiz 1	2
aug. 30	w	Climate change (The Science)			2
sep. 1	f	Climate change (Future Impacts)			2
sep. 4	m	<b>NO CLASS- Labor Day</b>	Chapter 1	Reading quiz 2	3
sep. 6	w	Introduction to weather and climate		Assignment #1 due	3
sep. 8	f	Atmospheric composition and structure			3
sep. 11	m	Atmospheric composition and structure	Chapter 2	Reading quiz 3	4
sep. 13	w	Forms of energy		Assignment #2 due	4
sep. 15	f	Earth-Sun relationships			4
sep. 18	m	Earth-Sun relationships	Chapter 3	Reading quiz 4	5
sep. 20	w	Energy balance		Assignment #3 due	5
sep. 22	f	Energy balance			5
sep. 25	m	Controls on temperature		Reading quiz 5	6
sep. 27	w	Review for Exam #1			6
sep. 29	f	<b>Exam #1</b>			6

oct. 2	m	Atmospheric humidity	Chapter 5	Reading quiz 6	7
oct. 4	w	Controls on humidity			7
oct. 6	f	Condensation: Dew, fog, and clouds			7
oct. 9	m	Dew, fog, and clouds (continued)	Chapter 6	Reading quiz 7	8
oct. 11	w	<b>NO CLASS</b>		Assignment #4 due	8
oct. 13	f	<b>NO CLASS- Fall Break</b>			8
oct. 16	m	Stability and clouds	Chapter 7	Reading quiz 8	9
oct. 18	w	Stability and precipitation		Assignment #5 due	9
oct. 20	f	Precipitation			9
oct. 23	m	Precipitation	Chapter 4	Reading quiz 9	10
oct. 25	w	Atmospheric pressure and winds		Assignment #6 due	10
oct. 27	f	Atmospheric pressure and winds			10
oct. 30	m	Atmospheric pressure and winds		Reading quiz 10	11
nov. 1	w	Review for Exam #2			11
nov. 3	f	<b>Exam #2</b>			11
nov. 6	m	Global systems	Chapter 8	Reading quiz 11	12
nov. 8	w	Global systems			12
nov. 10	f	<b>NO CLASS- Veterans Day</b>			12
nov. 13	m	Mid-latitude cyclones	Chapter 9	Reading quiz 12	13
nov. 15	w	Mid-latitude cyclones	Chapter 10	Assignment #7 due	13
nov. 17	f	Hurricanes/Tropical Cyclones	Chapter 12		13
nov. 20	m	Hurricanes/Tropical Cyclones		Reading quiz 13; Assignment #8 due	14
nov. 22	w	<b>NO CLASS- Thanksgiving</b>			14
nov. 24	f	<b>NO CLASS- Thanksgiving</b>			14
nov. 27	m	Thunderstorms	Chapter 11	Reading quiz 12	15
nov. 29	w	Tornadoes			15
dec. 1	f	Weather forecasting	Chapter 13		15
dec. 4	m	Earth's climates	Chapter 15	Reading quiz 14	16
dec. 6	w	Last day of class: Review for Final Exam		Assignment #9 due	16
dec. 14	TR	<b>Final exam (10-11:45 am)</b>			