

# Geog 280/Envr 300: Weather, Climate, and Society

Professor: Dr. Stephanie Spera  
Office: 308 International Center (INTC)  
Email: [sspera@richmond.edu](mailto:sspera@richmond.edu)  
Office Hours: Thursday, 1:30 – 3 pm AND by appt.

Time and Location:  
MW 12 – 1:15 pm  
Weinstein Hall 209

## Course Description

This course provides students with an understanding of the processes that drive weather patterns, the general circulation of the atmosphere, and climate on earth. Weather phenomena occur on short time scales, yet form the basis for understanding climate, the study of changes over longer time scales. In this class, we will develop an understanding of why weather happens, and why weather changes. We will learn how to interpret weather maps. We will gain new quantitative skills while learning about physical laws that govern weather and climate patterns. We will learn about the climate system, and the physical basis for climate change today compared to the past. And, we will discuss the effects of weather, extreme weather events, and changes in climate on people living in different regions of the world.

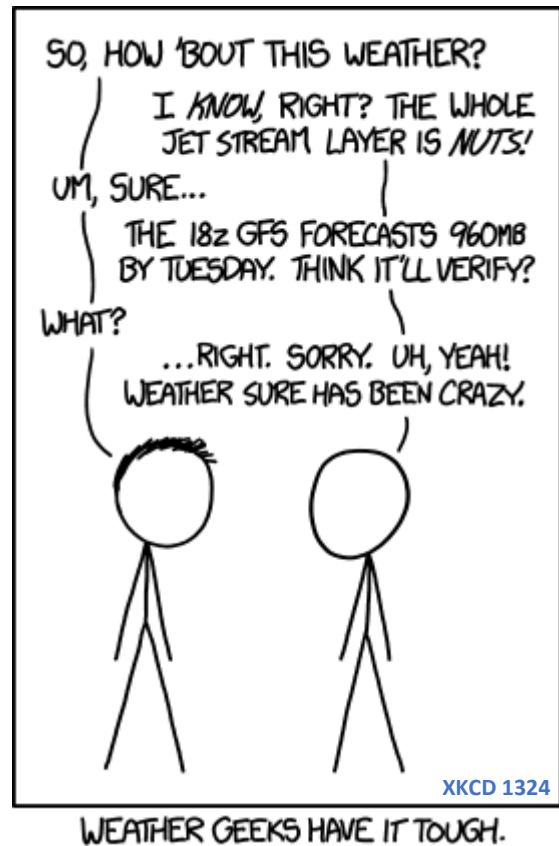
## Course Objectives

By the end of this class, you should be able to:

- 🌀 Develop a solid understanding of why weather happens, understand changes in weather, and be able to interpret weather maps
- 🌀 Gain new quantitative skills in the process of acquiring knowledge about the physical laws that govern weather and climate patterns
- 🌀 To understand the myriad ways, minor and major, that weather, climate, and society are intertwined
- 🌀 To develop critical thinking skills, scientific literacy, and writing skills.

## Course Materials

The required textbook for this course is *Understanding Weather and Climate* (6<sup>th</sup> or 7<sup>th</sup> ed) by E. Aguado and G.E. Burt. We will also be reading Mike Hulme's, *Weathered: Cultures of Climate*. Additional readings from other sources will be assigned during the semester. These readings will be accessible through the course web page on Blackboard.



## Course Work

These course objectives will be assessed through **problem-sets, quizzes, readings, in-class activities, projects, and participation, allowing you multiple opportunities and venues for you to succeed.**

Attendance is mandatory, let me know ahead of time if you cannot make it to class. You are responsible for all materials presented in class, including any announced changes to the syllabus. In the event of an absence, you are encouraged to obtain missed notes from fellow classmates when necessary.

### *Semester-Long Weather Journal (10%)*

George Washington, James Madison and Thomas Jefferson all took regular thermometer readings at their homes and kept weather logs. Nerds, amirite. Now you can join the first three presidents of the United States and keep your own weather log.

### *Quizzes (35%)*

Four quizzes will be given during the semester and will be designed to test your knowledge gained through the readings, lectures, in-class activities and problem sets. No makeup quizzes will be given except in the case of legitimate and verifiable extenuating circumstances and if you me at least 24 hours before hand.

### *Weather Analysis (10%)*

Building off your weather journal, this project will involve several activities – not only keeping a daily log of local atmospheric conditions; but also interpreting changes in local conditions in the context of large, propagating weather patterns; evaluating the accuracy of forecasts. The purpose of this activity is to gain a scientific perspective on weather (and climate) and develop an intuition for weather changes. More details to come.

### *Project 1 (10%)*

The first project will involve analyzing weather and climate data from one of our community partners to help them understand how weather and climate are affecting the lives of Richmonders. You will be given data on visitors to the James River Parks, and Lewis Ginter Botanical Garden tasked with coming up with your own weather-society related hypothesis. More details to come.

### *Project 2 (10%)*

The second project is less-structured and will allow you to stretch your creative muscles. Thinking about our time in the Book Arts studio, you will be tasked with creating a children's book aimed at 2<sup>nd</sup> grade level (6-8 year olds) on some weather or climate phenomena we've learned about in class. Then, provided partnerships with community members work out, you will have the opportunity to focus group your book with actual second and third graders! More details to come.

### *Problem Sets and In-Class Activities (15%)*

Problem sets and in-class activities are designed to help you develop a quantitative and conceptual understanding of the physical relationships that govern the atmosphere and its behavior. These exercises will build skills in scientific reasoning and critical thinking as well as data compilation, data analysis, and plotting/graphics. Workbook or problem-solving exercises will help to reinforce the material from the textbook and lectures. All of it will help prepare you for quizzes.

These in-class activities will often occur un-announced. These points can only be made up if you notify me of your absence in advance, and only in verifiable, extenuating circumstances.

The first of these “Problem Sets” is a short paper, **due Sept 6 at 5pm.**

The short paper assignment is designed to give you a chance to think about what interests you in regard to weather and climate. Complete a 2-page summary of a recent newspaper, magazine or similar media article that discusses a relevant weather or climate topic that is of interest to you. You will summarize the event or topic (2%); discuss whether the article provides any physical basis or reasoning for why the event or topic occurred (1%); describe what you think is the physical reason behind the event (1%); list at least three (3) questions that this article raises for you or makes you want to understand more about (1%).

*Participation: Class Instagram/Blog, Reading Reflections, Engaged Participation (10%)*

Your participation grade will be divided into three equal parts, as described below.

1. Weather and Climate in Everyday Life. Throughout the semester, you will need to take least two photos (which definitely can but doesn't not have to be a selfie) of something you come across (a weather/climate phenomenon) in your everyday life related to a topic we've learned about in class. The first is due by the last class before fall break (Wednesday, Oct. 9), and the second is due by our final class (Wednesday, Dec. 4). You will post these pictures on Blackboard “Weather and Climate In Everyday Life” blog with the following info:
  - a. Weather/event – what did you take a picture of
  - b. A jargon-free two-three sentence description of meteorological or climatological process (i.e. explain what's going on in your photo as you would to your classic major friend who has sworn off all science)
  - c. Optional, punny hashtags.

With your permission, I will post these photos my lab Instagram throughout the term – feel free to follow it (@spera.lab.ur), and also feel free to follow my pets' Instagram (@kenneth.and.edgar). It's completely okay if you do not want your photos posted, just let me know either way.

2. We will have reading assignments throughout the semester. You will be asked to read assigned chapters or papers and answer a short set of questions before each class on Wednesday.
3. Engaged participation. Engaged participation will be evaluated using the following guidelines:

Grade	Behavior
9-10/10	Always well prepared for class; facilitates productive peer discussions; offers reasoned responses of high quality and asks thoughtful questions on an ongoing basis.
7-8/10	Contributes regularly; generally prepared; asks questions and provides occasional responses of moderate quality; handles direct questions satisfactorily.
6/10	Participates infrequently; needs to be prodded; weak preparation; allows other to carry the ball in class discussions
5/10	Often inadequately prepared; little involvement in class discussions; repeatedly late or leaves during class.
0-4/10	Unprepared; disruptive in class; unauthorized use of computers during class – e.g. email, gChat; general browsing; repeated talking with other students about topics not related to class.

**The final grade will be determined based on University of Richmond guidelines**

(<http://registrar.richmond.edu/services/policies/grading.html>):

A > 93.5; A- 89.5 – 93.4; B+ 87.5 -89.4, B 83.5-87.4; B- 79.5-83.4; C+ 77.5-79.4; C 73.5-77.4; C- 69.5-73.4; D+ 67.5-69.4; D 59.5-67.4; E < 59.5

Course Policies

**Late work will not be accepted**, which means if something is not turned in on time, **you will earn a 0** on that assignment. However, I understand that sometimes life gets in the way, so if you know you're going to have a problem attending class, turning in an assignment, e-mail me or stop by my office to chat **beforehand**. Or else it is a 0.

The classroom is a place of learning and respect. In order to maintain the proper learning environment, you should not engage in any other activities during class time. Please do not distract others by arriving late, leaving early, or chatting during class.

We will foster an inclusive and respectful environment in the classroom. I expect this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. If you ever feel uncomfortable in class, please do not hesitate to let me know.

If you prefer to go by an alternate name or gender pronoun, do not hesitate to let me know, and I will happily honor that request.

This course generally has a no cell-phone and laptop policy. But, bring your laptops to class as we will sometimes use them for in-class activities and research. We do ask that these devices be closed/off for note taking. Students' use of laptops in classrooms often contributes to multitasking and off-task behaviors (e.g., Kay & Lauricella, 2011) which, in turn, interfere with their performance (e.g., Fried, 2008; Hembrooke & Gay, 2003; Krausharr & Novak, 2010) and that of their peers (Sana et al. 2013). Even in the absence of off-task behaviors, such as internet

browsing, notetaking via laptops compared to longhand may lead to shallower processing and, thus, less retention of course material (e.g., Mueller & Oppenheimer, 2014). Data do not favor the use of electronics in classrooms for lecture and discussion. Please ensure that laptops, iPads, phones, and other electronic devices are silenced and out of view when not required. Computer use for academic purposes will be specified by the instructors. Failure to comply with this policy may result in a reduction in your participation grade. **If you do feel like you need to use your laptops for note-taking, please write a paragraph reflecting on your previous experiences taking notes during lectures, study habits, reasons you feel a laptop will be beneficial to your performance in this class, and please include a line stating you will only use the laptop for note-taking purposes (i.e not internet browsing), and submit this to me via email.**

### Literature Citation Guide

The Department of Geography and Environment uses the APA style to cite literature when appropriate. A comprehensive reference guide to APA citation style can be found here ([https://libguides.richmond.edu/ld.php?content\\_id=46073175](https://libguides.richmond.edu/ld.php?content_id=46073175)) and on Blackboard.

### Academic Honesty

All students are expected to abide by the University of Richmond's Honor Code. The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Report any violations you witness to the instructor.

### Religious Observances

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me before January 18<sup>th</sup> to discuss appropriate accommodations.

### Calendar (v. subject to change)

Week	Dates	Topics	Readings	Important Events to Note
1	M, 8/26	Class Intro		
	W, 8/28	Book Arts, Part 1		
2	M, 9/2	The Atmosphere	<i>(7<sup>th</sup> ed.) Chapter 1</i>	
	W, 9/4	Book Arts, Part 2	Hulme, Ch. 1 & 2	Short paper due Friday, 9/6 at 5pm
3	M, 9/9	Pressure + Forces	<i>(7<sup>th</sup> ed.) Chapter 4</i>	Journal Check
	W, 9/11		Hulme, Ch. 3 & 4	
4	M, 9/16	Solar Radiation	<i>(7<sup>th</sup> ed.) Chapter 2</i>	
	W, 9/18		Hulme, Ch 5 & 6	Quiz
5	M, 9/23	Energy Balance + Global Temp	<i>(7<sup>th</sup> ed.) Chapter 3</i>	
	W, 9/25		Hulme, Ch 7 & 8	
6	M, 9/30	Water in the Atmosphere	<i>(7<sup>th</sup> ed.) Chapter 5, 6, 7</i>	Journal Check
	W, 10/2		Hulme, Ch 9 & 10	

7	M, 10/7	Global Circulation, Air Masses & Fronts	(7 <sup>th</sup> ed.) Chapter 8, 9	
	W, 10/9		Hulme, Ch 11 & 12	Quiz
8	M, 10/14	<b>FALL BREAK</b>		
	W, 10/16	Virginia Weather	(7 <sup>th</sup> ed.) Chapter 8, 9	
9	M, 10/21	Tropical Storms and Hurricanes	(7 <sup>th</sup> ed.) Chapter 10, 11	Journal Check
	W, 10/23	Meet in Library – B26 Classroom		Project 1 Due Friday 10/25 at midnight
10	M, 10/28	Extreme Weather	(7 <sup>th</sup> ed.) Chapter 10, 11	
	W, 10/30	Weather + Climate + Art	Blackboard Readings	Quiz
11	M, 11/4	Weather Forecasting	(7 <sup>th</sup> ed.) Chapter 13	
	W, 11/6	Weather + Climate + Lit	Blackboard Readings	
12	M, 11/11	ENSO	(7 <sup>th</sup> ed.) Chapter 8	
	W, 11/13	Guest Speaker, Jeremy Hoffman, VA Museum of Science		Weather Log Project Due 11/15 at midnight
13	M, 11/18	Defining Climate Change	(7 <sup>th</sup> ed.) Chapter 15	
	W, 11/20	Weather + Climate + Movies	Blackboard Readings	Quiz
14	M, 11/25	All the ways humans are messing with the Earth	(7 <sup>th</sup> ed.) Chapter 14	
	W, 11/27	<b>No Class, Thanksgiving / Watching the Detroit Lions lose</b>		
15	M, 12/2	Climate modelling + paleoclimate records	(7 <sup>th</sup> ed.) Chapter 16	Last Journal Check
	W, 12/4	Out-of-class Book Readings		Project 2 Due

### Student Needs

If you experience difficulties in this course, do not hesitate to consult with me. There are also other resources that can support you in your efforts to meet course requirements, including,

The *Academic Skills Center* (<http://asc.richmond.edu>, 289-8626 or 289-8956) assists students in assessing their academic strengths and weaknesses; honing their academic skills through teaching effective test preparation, critical reading and thinking, information conceptualization, concentration, and related techniques; working on specific subject areas (e.g., calculus, chemistry, accounting, etc.); and encouraging campus and community involvement. Hours at the Center are: Sunday through Wednesday 3:00-9:00 p.m. and Thursday 3:00-7:00 p.m. On-call tutors are also available.

*Boatwright Library Research Librarians* (<http://library.richmond.edu/help/ask/> or 289-8876): Research librarians assist students with identifying and locating resources for class assignments, research papers and other course projects. Librarians also provide research support for students and can respond to questions about evaluating and citing sources. Students can email, text or IM or schedule a personal research appointment to meet with a librarian in his/her office on the first floor Research and Collaborative Study area.

The academic environment at UR is challenging, our semesters are intensive, and classes are not the only demanding part of your life.

*Counseling and Psychological Services* (<http://wellness.richmond.edu/offices/caps/> or 289-8119) assists currently enrolled, full-time, degree-seeking students in improving their mental health and well-being, and in handling challenges that may impede their growth and development. Services include short-term counseling and psychotherapy, crisis intervention, psychiatric consultation, and related services.

The *Speech Center* (<http://speech.richmond.edu> or 289-6409) assists with preparation and practice in the pursuit of excellence in public expression. Recording, playback, coaching and critique sessions offered by teams of student consultants trained to assist in developing ideas, arranging key points for more effective organization, improving style and delivery, and handling multimedia aids for individual and group presentations.

The *Writing Center* (<http://writing.richmond.edu> or 289-8263) assists writers at all levels of experience, across all majors. Students can schedule appointments with trained writing consultants who offer friendly critiques of written work.

*The Office of Disability Services* (<https://disability.richmond.edu/students/index.html> or 289.8032) works to ensure that qualified students with a disability (whether incoming or current) are provided with reasonable accommodations that enable that student to participate fully in activities, programs, services and benefits provided to all students. **Students with special needs that require an accommodation or an academic adjustment, please arrange a meeting with Dr. Spera within the first two weeks of the semester.**

#### Useful Resources:

- Regional National Oceanic and Atmospheric Administration site for New England  
[http://www.erh.noaa.gov/er/box\\_and\\_weather\\_prediction](http://www.erh.noaa.gov/er/box_and_weather_prediction)  
<http://www.wpc.ncep.noaa.gov/>
- Weather Underground <http://www.wunderground.com>
- RealClimate (Climate science from climate scientists) <http://realclimate.org/>
- The Yale Forum on Climate Change and the Media  
<http://www.yaleclimatemediaforum.org>
- Capital Weather Gang Blog <https://www.washingtonpost.com/news/capital-weather-gang/>