

# Processes of Global Environmental Change

## GEOL 335 / MSCI 335



**Location/Time:** Lecture: Coker 102 MWF 12:00 – 12:50pm  
Lab: Sumwalt 241 M 2:20-5:20pm, W 3:30-6:30pm

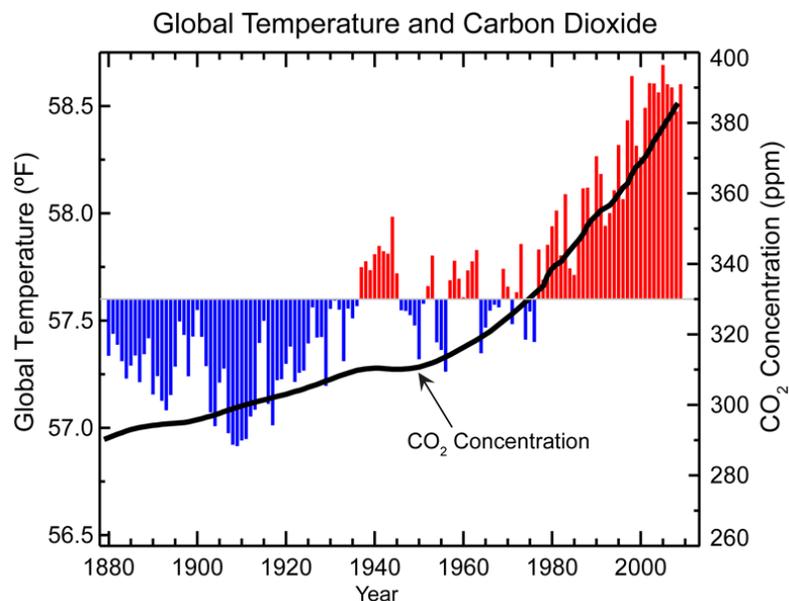
**Instructor:** Dr. Lori Ziolkowski (Dr. Z)  
office hours by appointment  
[loriz@sc.edu](mailto:loriz@sc.edu) (email is the best way to contact me)

**Course website:** on Blackboard.

**Instructional Assistant:** Natalie Tyler

### What is climate change?

In this course we explore the science of climate change from a variety of angles. We begin by discussing what governs climate over geologic time including the physics of the greenhouse effect. The second part of the course focuses on the differentiating weather from climate, evidence of climate change and the sensitivity of climate to changes. In the final section of the course we will explore impacts, vulnerabilities, suitable adaptation and mitigation strategies. By the end of this class, you will be able to discuss the major pieces of evidence about why climate is changing and why this is of great concern, as well as conduct an educated conversation about what are suitable next steps society should be taking.



Questions? Ask either in class or via email: [loriz@sc.edu](mailto:loriz@sc.edu).

## Learning Goals

There are two fundamental objectives for this course: **1) to separate facts from personal opinion and scientific uncertainty from political, moral or ethical bias, and (2) to learn how to effectively communicate about climate change with people in your life.** This course focuses on the scientific aspects of climate change and “Global Warming”, including issues of uncertainty. The public discourse about climate change is highly polarized even though the vast majority of scientists (97%) agree that climate change is occurring. This course cannot offer simple answers to how to stop climate change, but we can separate facts from personal/political/special-interest opinion and engage in nuanced and informed discussions about what we can/should/must do/must not do about climate change.

Learning goals	Learning outcomes – You will be able to:
Knowledge and Geographic Literacy	<ol style="list-style-type: none"> <li>1) Identify and discuss facts and concepts of the climate system, paleoclimate and climate change.</li> <li>2) Understand systems thinking and feedbacks as related to the changing climate system.</li> <li>3) Distinguish between natural and human influences on the climate system and their interplay.</li> </ol>
Critical Thinking Information Literacy Scientific Literacy	<ol style="list-style-type: none"> <li>1) Have confidence in your critical thinking skills despite uncertainty, ambiguity or controversy.</li> <li>2) Evaluate the quality, accuracy, reliability, objectivity and timeliness of information and sources.</li> <li>3) Understand the role and limitations of science and the scientific method in public policy and decision-making.</li> <li>4) Communicate about climate change with both scientists and non-scientists in both spoken and written form.</li> </ol>
Perspective Implications	<ol style="list-style-type: none"> <li>1) Understand space, time and change as relevant global concepts.</li> <li>2) Evaluate interactions between human and environmental systems at a variety of scales across space and time.</li> <li>3) Recognize the global connections between climate change, impacts, energy use, sustainability and equity.</li> </ol>

## Course Logistics

We meet three times a week for 50 minutes of “lecture” and once a week for “lab”. Classes will include lectures, readings, discussions, data analysis, etc. Lab exercises are homework assignments designed to reinforce material discuss in class, introduce additional concepts and related issues.

This course requires continuous and active participation through reading, writing and discussion. Missing class or lab for any reason leaves you with a considerable gap in your learning. The course is broadly structured around the topics shown in the schedule below, but allocation of time and topics remains flexible and depends on current events, student interest, guest speakers and other factors.

### Required text (required):

Global Warming: Understanding the Forecast (2<sup>nd</sup> ed.)

David Archer, September 2011

ISBN: 978-0-470-94341-0

<http://forecast.uchicago.edu>

Additional resources (papers, website and video links) will be added to Blackboard throughout the semester.



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## Assessment

Your course grade reflects your learning process through the entire semester and combines all grades. You cannot “flunk” this course based on any one poor grade.

- If you are concerned about your grades or your performance – please talk to me.
- Please allow at least one week for grades to be ready.
- No make-up tests, homework assignments, etc. unless you are experiencing a documented emergency.
- No extra-credit assignments and all due dates/times are mandatory.
- **Late policy:** Immediate 10 % deduction of assignment grade and 10 % deduction for additional each day late, ‘skipped’ = zero.

Grade conversion	
100 – 90	A
89 – 86	B+
85 – 80	B
79 – 76	C+
75 – 70	C
69 – 66	D+
65 – 60	D
<60	F

I expect professional work all the times and it is your responsibility to ask for help or clarification of my expectations. If you have questions, please ask.

### Three take-home tests (40 %, 13.3% each)

These tests will cover a selection of several pre-defined topics and may include quantitative data analysis and/or data collection as well as analysis of climate concepts. You will have about one week to complete each test. Example answers and a grading rubric will be provided.

### Lab assignments (n=8, 35 %, 4.38% each)

Starting the week after Labor Day (September 11, 2017), there will be weekly assignments that combine quantitative analysis during the lab with additional post-class reflection/research. Assignments typically involve data analysis during the lab and writing in connection with the data and an assigned reading. There will be no labs/assignments the week of Fall Break (October 19, 20) or Thanksgiving (November 22, 23, 24).

### Term paper (20 %)

A term paper will be a central part of the course. The project consists of a written research report based on your research, complete with illustrations and references. The written report is due on the last Monday day of classes (Monday December 4, 2017). The report must be at least five pages long, typed, double-spaced with margins no bigger than 1” (page length does not include figures/illustrations and references, which are both important). No more than half of the references can be websites. A topic list will be discussed in class.

### Participation / attendance (5 %)

Class will be more enjoyable for everyone if you come prepared and participate. Also, the USC Bulletin for Undergraduate Studies states that absences of more than 10 % of the schedule class sessions are excessive – both excused and unexcused absences count toward this 10 %. Therefore, if you miss more than five classes, you are subject to a reduction in your letter grade, per USC policies.

## (not so) Small print

**No slides will be posted to Blackboard**, as this course is mostly taught on the white board. Therefore, come prepared to take notes on paper. **Computers, iDevices, etc cannot be used without prior approval.** Ultimately this is for your own benefit. Over the years, studies have shown that students learn more when they take notes with a pen or pencil and paper!

Just as you probably expect me to act respectfully towards you, I expect the same from you – to act respectfully to both myself and the other students. Please silence your cell phones before class. Please do not text, surf, snapchat, etc during class. It is distracting for your neighbors and me. If you are found being disrespectful, you may lose your attendance grade and may be asked to leave class.

With all that said, **I sincerely hope you enjoy this class.** I encourage you to ask questions and start discussions about any concepts, misconceptions, preconceptions, current events or anything you have encountered related to climate change. Please feel free to contact me via email, talk to me after class or arrange a time to meet outside of class with any questions you may have. I welcome the opportunity to talk with you and I strive to provide you with an interesting and enlightening semester about climate change!

## Caveats and other info

### Plagiarism:

As commonly defined, plagiarism consists of passing off one's own ideas, words, writings, etc, which actually belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own work, even if you have the permission from the person who's work you copied. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. This is a grievous offence and will not be tolerated. Individuals guilty of plagiarism will be severely penalized.

### Academic Integrity:

The University of South Carolina Honor Code states:

“It is the responsibility of every student at the University of South Carolina Columbia to adhere steadfastly to truthfulness and to avoid dishonesty, fraud, or deceit of any type in connection with any academic program. Any student who violates this Honor Code or who knowingly assists another to violate this Honor Code shall be subject to discipline.”

By signing your name to a quiz, test assignment, etc, you are acknowledging adherence to the Honor Code. More information can be found at: [www.sc.edu/academicintegrity/honorcode.html](http://www.sc.edu/academicintegrity/honorcode.html).

**The American with Disabilities Act (ADA)** is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please contact the instructor before you need accommodations.

### Academic Responsibility:

Faculty and students at USC are obligated to follow the USC Code of Academic Responsibility. I expect all class members to demonstrate intellectual honesty and to respect the academic rights of their classmates. If you have forgotten your responsibilities under this Code, please re-read Student Affairs Policy STAF 6.25 on USC's web page.

Questions? Ask either in class or via email: [loriz@sc.edu](mailto:loriz@sc.edu).

<b>Tentative Course Schedule GEOL/MSCI 335 (Fall 2017)</b>		
<b>Week</b>	<b>Dates</b>	
<b>1</b>	8/28 – 9/1	<p><b>The Scientific Basis</b></p> <p>The basics of the climate system and atmosphere.  Radiative forcing: greenhouse gasses and greenhouse effect.  Earth's energy budget.</p>
<b>2</b>	9/4 – 9/8 no class Monday	
<b>3</b> Lab 1	9/11 – 9/15	
<b>4</b> Lab 2	9/18 – 9/22	
<b>5</b> Lab 3	9/25 – 9/29	
<b>6</b> Test #1	10/2 – 10/6	
<b>7</b> Lab 4	10/9 – 10/13	
<b>8</b>	10/16 – 10/20 Fall break, no class F	
<b>10</b> Lab 5	10/23 – 10/27	
<b>10</b> Lab 6	10/30 – 11/3	
<b>11</b> Test #2	11/6 – 11/10	
<b>12</b> Lab 7	11/13 – 11/17	<p><b>Now what?</b></p> <p>Paris Agreement!  Impacts and vulnerability  Mitigation and adaptation  Geoengineering  Policies and Politics</p>
<b>13</b>	11/20 – 11/24 Thanksgiving, no class W, F	
<b>14</b> Lab 8	11/17 – 12/1	
<b>15</b> Test #3	12/4-- 12/8 <b>Written report due (12/4)</b>	

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