

AOS/IES 171

Fall 2023

3 credits

**GLOBAL CHANGE: ATMOSPHERIC ISSUES AND PROBLEMS**

MWF 11:00-11:50 am AOSS 811 & 823

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Web page: <https://canvas.wisc.edu/> (login with your NetID to access course)

### Course Materials

- All readings will be posted online or provided in class
- **Optional:** Dessler, Andrew. Introduction to Modern Climate Change, Cambridge University Press, 2<sup>nd</sup> edition, 9781107480674 (\$46)
- **Optional:** Oreskes, Naomi and Erik Conway. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*, Bloomsbury Press, 978-1596916104 (\$18)
- Lecture slides (posted at web site), Space Sciences library reserve, and course articles

### Course Objective and Content

How do we know that humans can alter the composition of the air we breathe and why does this matter? In this course, we will understand how scientists understand elements of global climate and atmospheric change, apply this understanding to observe and predict the effect of these changes on society, and evaluate policy options to limit harmful effects.

The course requires a combination of in-class discussion and out-of-class material (written, video, and others) to explore this theme. We will focus both on scientific understanding and uncertainties, since it is the uncertainties that make discussion about whether and how to change human behavior so complicated, and also on underlying human issues that drive global change. Human psychological, social, and industrial factors are inextricably intertwined with global change issues. These factors guide the strategies and policies society might adopt. As a Communications Part B General Ed, this course also focuses on the communication of scientific knowledge about climate and builds skills in multiple forms of oral and written communication of scientific material.

### Course Outcomes

By the end of this course, you should be able to knowledgeably debate questions such as:

- How does past climate change contrast to modern climate change?
- Is increased drought frequency a sign of anthropogenic warming or just natural variability?
- Do the benefits of CFCs outweigh the costs on increased skin cancer from decreased ozone?
- Can government regulation influence the size of the stratospheric ozone hole?
- Is acid rain related to regional cooling?
- Are all aerosols harmful to human health?
- Do forestry/agriculture practices influence global climate?
- How might future climate change alter the state of human disease, food, and water supply?
- Can choices in energy consumption affect environmental degradation and international conflict?
- Are scientists and/or the media biased in their research and reporting of global change issues?

## Course Assessment

13 weekly in-class assignments, including writing, quiz, and oral activities (lowest 3 dropped)  
3 out-of-class experiences (1-2 page)  
2 longer (5-6 page) written assignments

Grades in this course are based on engagement and progress in writing and application of scientific concepts. Quizzes, papers, and participation are graded on a four-point scale: 0 = missing, 1 = needs more work, 2 = adequate, 3 = excellent. Written assignments can be resubmitted after revision. Final grades in the course are assigned based on overall review and self-assessment. An “A” grade would reflect a balance of primarily 2s and 3s, leaning toward more 3s, while a “B” would lean toward primarily 2s, and so on (1s C).

## Course structure

MONDAY courses are hybrid and will focus primarily on lectures by the Professor or assigned videos. These will be presented or played in-person in AOSS 811, but also streamed on zoom and recorded for later viewing. It is YOUR CHOICE whether to come to class Monday to listen or to watch at a future time prior to the next class.

After the first week, on WEDNESDAY and FRIDAY, the class will be split into two rooms, AOSS 823 and 811 alternating working with either the course teaching assistant or the professor, either one-on-one or in small groups. These in-class exercises are the primary assessment, including exercises that help you prepare for the two longer assignments. As a Comm-B and Physical Sciences breadth course, these exercises will include a mix of data analysis, interpretation of scientific findings, and reflection and in-class or post-class writing about these, including content presented on MONDAY.

This course meets general education requirements for **Communications Part B**, for which you need to write about 20 pages (including revisions), present orally, participate in discussions, and learn how we listen and read critically in this discipline. **Short assignments** will consist of 1-2-page responses that are due online either in class or before the following Monday determined by the activity. The **final short writing assignment** is an in-class debate. No late submissions will be accepted for the short writing responses.

**Two longer papers** will require further research, including synthesis of literature and course material. For each of these, we will have two deadlines: one for a draft and one for a final. Both are required. The drafts will be reviewed with the help of the peer undergraduate Writing Fellows at the UW Writing Center (<http://www.wisc.edu/writing/>), who will meet with you and discuss draft improvements. Late drafts will be read at discretion of the writing fellows. Meeting with the Writing Fellows is part the assignment.

The class also meets the **UW Natural Science breadth requirements for Physical Science** and for **Liberal Arts and Science Credit**. To meet these requirements, some in-class formative assessment will help reinforce quantitative and science concepts based on the readings and lecture material.

The **three out of class** assignments refer to attending seminars, webinars, talks, panels, activities, or field trips related to topics in the class, preferably events hosted by UW and on campus, many of which will be announced in class. You are welcome to find your own and run it by the professor to see if it fits. You are asked to attend the event, take notes, and submit online a short 1-2 page write-up summarizing the event, your reactions to it, and its link to the course.

There is no final.

All written work is submitted online, though in class assignments can be done on paper. You are required to bring a device or laptop to class for assignments and group work. Late submission requires prior accommodation (see below). Class attendance (in-person or virtual, as conditions permit) and active participation are expected.

## **Accommodation Policy**

Campus policy: “We believe in the right of all students who are enrolled at the University of Wisconsin-Madison to full and equal educational opportunity. Disability should not be the basis for exclusion from educational programs. All students are entitled to an accessible, accommodating, and supportive teaching and learning environment. ... Students are expected to inform faculty, in a timely manner, of their need for special instructional accommodations.”

Students requiring class accommodations due to a learning or physical disability must arrange for documentation from the McBurney Disability Resource Center (<http://www.mcburney.wisc.edu/> ; 608-263-2741, 702 W Johnson St, Suite 2014). Accommodations will be made in consultation with the McBurney Center and you.

Students who require temporary accommodations due to medical or psychological reasons should reach out to me or the TA. Counseling is available from University Health Services (<http://www.uhs.wisc.edu/>).

Please note that the pandemic is not over. Campus has instituted health and safety protocols based on local, state, and federal health guidelines. We have tested and improved our air handling and ventilation in the 8<sup>th</sup> floor classrooms that allows for safe activity in these rooms. However, if you are sick, feeling ill, or concerned about contagions, consider wearing a properly fitted KN95 or equivalent mask. Please do not come to class if you are experiencing Covid-related symptoms and please do follow quarantine and masking protocols if testing positive. Your grade will not be penalized for doing so, as with any other illness or medical leave, and I will do my best to accommodate remote participation or alternate activities.

## **Academic Honesty**

Since there is significant written and collaborative work required in this course, you should take a moment to familiarize yourself with the University academic misconduct policy. All items submitted for this course should be original works created by you and not previously submitted for another course. Minor instances of academic misconduct will be treated with requirement to repeat the offending assignment with a reduced grade. Major instances will lead to automatic failure for the course.

UWS 14 is the chapter of the University of Wisconsin System Administrative code that regulates academic misconduct. UW-Madison implements the rules defined in UWS 14 through our own “Student Academic Misconduct Campus Procedures.” UWS 14.03 defines academic misconduct as follows:

“Academic misconduct is an act in which a student:

- seeks to claim credit for the work or efforts of another without authorization or citation;
- uses unauthorized materials or fabricated data in any academic exercise;
- forges or falsifies academic documents or records;
- intentionally impedes or damages the academic work of others;
- engages in conduct aimed at making false representation of a student’s academic performance;
- assists other students in any of these acts.

Examples include but are not limited to: cutting and pasting text from the web without quotation marks or proper citation; paraphrasing from the web without crediting the source including use of AI language models such as ChatGPT; using notes or a programmable calculator in an exam when such use is not allowed; using another person’s ideas, words, or research and presenting it as one’s own by not properly crediting the originator; stealing examinations or course materials; changing or creating data in a lab experiment; altering a transcript; signing another person’s name to an attendance sheet; hiding a book knowing that another student needs it to prepare an assignment; collaboration that is contrary to the stated rules of the course, or tampering with a lab experiment or computer program of another student.”

## *Plagiarism*

Plagiarism means presenting the words or ideas of others without giving credit, including direct use of AI assisted

writing models without attribution. You should know the principles of plagiarism and the correct rules for citing sources. In general, if your paper implies that you are the originator of words or ideas, they must in fact be your own. If you use someone else's exact words, they should be enclosed in quotation marks with the exact source listed. You may put someone else's idea in your own words as long as you indicate whose idea it was (for example, "As Jane Smith points out, . . ."). If you are unsure about the proper ways to give credit to sources, ask your instructor or consult the Writing Center at 6171 Helen C. White Hall (phone: 608/263-1992, e-mail: [writing@wisc.edu](mailto:writing@wisc.edu)) for a copy of their handout "Acknowledging, Paraphrasing, and Quoting Sources,"

## Course Calendar

	Date	Lecture topic	Due Dates
<u>Week 1</u>	9/6/23	Introduction to Global Change	Introductions online
	9/8/23	Introduction to Global Change	
<u>Week 2</u>	9/11/23	Population and Development	
	9/13/23	Population and Development	
	9/15/23	Population and Development	
<u>Week 3</u>	9/18/23	Fossil Fuels and Energy	
	9/20/23	Fossil Fuels and Energy	
	9/22/23	Fossil Fuels and Energy	
<u>Week 4</u>	9/25/23	Earth System Science	
	9/27/23	Earth System Science	
	9/29/23	Earth System Science	
<u>Week 5</u>	10/2/23	Acid Rain and Air Pollution	Paper 1 Draft
	10/4/23	Acid Rain and Air Pollution	
	10/6/23	NO CLASS	
<u>Week 6</u>	10/9/23	Ozone Layer	
	10/11/23	Ozone Layer	
	10/13/23	Ozone Layer	
<u>Week 7</u>	10/16/23	Greenhouse Gases	
	10/18/23	Greenhouse Gases	
	10/20/23	Greenhouse Gases	
<u>Week 8</u>	10/23/23	Climate system	Paper 1 Final
	10/25/23	Climate system	
	10/27/23	Climate system	
<u>Week 9</u>	10/30/23	Climate change	
	11/1/23	Climate change	
	11/3/23	Climate change	
<u>Week 10</u>	11/6/23	Climate change	
	11/8/23	Climate change	
	11/10/23	Climate change	

<u>Week 11</u>	11/13/23	Ice and Oceans	
	11/15/23	Ice and Oceans	
	11/17/23	Ice and Oceans	Paper 2 Draft
<u>Week 12</u>	11/20/23	Climate Solutions	
	11/22/23	Climate Solutions	
	11/24/23	NO CLASS THANKSGIVING	
<u>Week 13</u>	11/27/23	Climate Solutions	
	11/29/23	Climate Solutions	
	12/1/23	Climate Solutions	
<u>Week 14</u>	12/4/23	Climate Policy	
	12/6/23	Climate Policy	
	12/8/23	Climate Policy	
<u>Week 15</u>	12/11/23	The Future of Global Change	
	12/13/23	The Future of Global Change	Paper 2 Final

NO FINAL