



Thursdays, 3:30-6, Warren Weaver Hall 1314

Instructor

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Office Hours: Tuesdays and Wednesdays, 4:30-5:30, Warren Weaver Hall 911

Course Description

2014 was the warmest year in recorded history, but how come there was so much snow and cold in the Northeast this year? Should we build the Keystone XL pipeline or invest more in renewable energies? What about “geoengineering” our climate, modifying other parts of the climate system to offset the impact of greenhouse gas emissions?

Climate change continues to inject itself into headlines, despite the reluctance of political leaders to have a serious conversation. Many fear that the topic is calcifying into another front in the cultural wars, where political affiliation matters more than scientific and economic analysis. Climate change provokes strong opinions not only because of the great environmental, economic, and political implications, but also how it injects itself into our daily lives on such a personal level, impacted each time we flip a switch, decide what's for dinner, or interact with a screen of any size.

To help you make informed decisions about climate change, this course explores the science of global warming and policy. We investigate the evidence from observations and the physical and mathematical foundations upon which forecasts of future climate are based. What are the key uncertainties in the predictions, and what steps are required to reduce them? What are the costs of taking action today, or responding to potential consequences tomorrow? Armed with this scientific basis, you then conduct your own research project on the policy side of climate change, giving you a chance to enter the debate, and perhaps contribute to the solution!

Required Textbooks

Archer, David: 2012, *Global Warming: Understanding the forecast (2nd Edition)*, John Wiley and Sons, 203 pp.

Frankfurt, Harry G.: 2005, *On Bullshit*, Princeton University Press, 67 pp.

Walker, Gabrielle: 2007, *An Ocean of Air*, Houghton Mifflin Harcourt, 288 pp.

Additional resources will be posted on the course webpages as the semester progresses. Here are a few *optional* textbooks that you might also find useful.

Dessler, Andrew E., 2012, *Introduction to Modern Climate Change*, Cambridge University Press, 238 pp.

Weart, Spencer: 2008 *The Discovery of Global Warming*, Harvard University Press, 230 pp.

Weaver, Andrew and Edward Parson, 2006, *The Science and Politics of Global Climate Change, A Guide to the Debate*, Cambridge University Press, 190 pp.

Class Expectations

As this is a honors level seminar, you should be prepared for more robust reading and writing assignments. You will be expected to analyze and challenge various texts, take part in and lead class discussions, and conduct a substantial research project. Given the politicized nature of the climate debate, it's critical to develop a healthy sense of skepticism. That's right, being skeptical is especially important for this class! Any scientific and policy claim should be backed up with evidence and sound reasoning. Unfortunately skepticism is sometimes confused with ignorance, particularly in the case of so-called "climate skeptics." Its equally important to give weight to all the facts and arguments, and be willing to alter one's view as the situation demands.

Course Requirements

1. Attendance is mandatory. Absences will be excused only in the case of an emergency, illness, religious observance, or officially sanctioned university event. ***If you are ill or cannot possibly make it to class, please e-mail me ahead of time.*** I appreciate that there are certain situations (such as a family emergency) when it is not possible to contact me in advance; in this instance, please contact as soon as reasonable and we'll work things out. ***Given that our course meets just once a week, you are allowed at most one unexcused absence. After that, each additional unexcused absence will lead to a 1/3 letter grade reduction of your final grade (that is, a A to A-, A- to B+, etc.).*** Please let me know in advance if you anticipate that religious commitments or your athletic schedule may lead to more than one or two absences, so we can ensure that you don't fall behind in the course.

2. Class participation is an integral part of the course. For most meetings, ***two students will be responsible for leading part of the discussion. On that day, the you will be responsible for preparing a 10-15 minute presentation on what you think are the key ideas of the reading assigned for that day.*** You can also raise any questions or issues about the reading that are confusing or unclear.

3. Homework. Each week I'll assign a set of questions concerning the reading for the next week. *They will be due by 9 am each Thursday before class.* These are chiefly to get you thinking creatively about the text. You will submit your responses to the course's NYU Classes webpage.

4. All students will conduct two course projects, detailed in the next section. The first will consist of a 1-2 page proposal and a 6-8 page essay due during the middle of the semester. The second will include a 1-2 page proposal and then a final paper or website of length 12-16 pages (or equivalent, for web documents) to be completed by the last class. You'll also present the topic of your final paper to the rest of the class at the end of the semester. For both assignments we'll divide the class into peer reading groups to help evaluate and improve your writing.

Course Projects

Over the course of the semester you will complete two papers. In the first you will focus on a scientific topic related to climate change. The second is a longer paper where you explore an element of climate change policy. You'll also present the topic of your final paper to the rest of the class. To encourage you to get started, you will need to formally propose the topics for your papers well before they are due.

1) Science Paper, 6-8 pages. **Topic proposal (1 pages plus bibliography of sources) due September 24, first draft due October 8, final draft due October 22.** In this paper, you will explore a scientific issue related to climate change. *You must read and discuss at least one peer reviewed scientific paper, including other references as appropriate.* I will help you focus in on a science paper, based on your topic proposal. The first draft is due early so that you can get feedback from your peers and myself. Possible topics include: feedbacks that amplify or reduce climate perturbation, the details of a particular anthropogenic forcing on the climate, or the response of part of the natural ecosystem to climate forcing.

2) Policy paper, 12-16 pages. **Topic proposal + outline (1-2 pages, plus tentative bibliography) due Nov. 12, final draft due last day of class, December 10.** The goal of the final project is to explore a policy related issue involving climate change. As with your first paper, you must document all your source materials, *which must include at least two recent peer reviewed scientific or economic studies.* Possible ideas to explore include a particular strategy to (a) limit or mitigate anthropogenic forcing of the climate (b) adapt society to a changed climate, or (c) use geoengineering to limit adverse effects of climate change. While climate change is global, you are encouraged to focus locally in the final paper. For example, in terms of reducing emissions or adapting, what should New York City (or even NYU) do?

Grade Policy (*approximate*)

Class Discussion (leading+general participation)	10%
Weekly written homework	15%
Mid-term Research Paper	25%
Final Presentation + Discussion	10%
Final Paper	40%

Tentative Course Schedule

Week	Topics	Readings
Sept 3	Introduction	The Climate of Man*
Sept 10	Radiation Basics + Layer Model	Archer 1–3
Sept 17	Bullshit + Greenhouse Gases	Frankfurter, Archer 4, Walker 3
Sept 24	Atmospheric Structure	Archer 5, Walker 1
Oct 1	Atmospheric Circulation	Archer 6, Walker 4
Oct 8	Peer review + Climate Feedback	Archer 7
Oct 15	Carbon on Earth + Fossil Fuels	Archer 8-10
Oct 22	Evidence of Change	Archer 11, Steffen et al. (2011)*
Oct 29	The Climate Forecast	Archer 12, IPCC Report*
Nov 5	OneNYC: What is New York City Doing about Climate Change?	Archer 13, Pacala and Socolow (2004)*
Nov 12	Climate Policy	IPCC Report*
Nov 19	Climate Policy	IPCC Report*
Nov 26	Turkey (or tofurky)	Happy Thanksgiving!
Dec 3	Ozone Hole: A Problem Solved	Walker 5, Ozone Report*
Dec 10	Student Presentations	

*To be posted on the course webpage / distributed via e-mail.