



Tuesdays and Thursdays, 4:55-6:10, Warren Weaver Hall 1314

Instructor

Edwin Gerber

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WWH 910, Office hours Thursday 2-4, or by appointment

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Course Description

"An inconvenient truth" or "the greatest hoax ever perpetrated on the American people?" Former Vice President Al Gore and Senator James Inhofe speak from the poles of the sometimes rancorous debate over global climate change and the actions, if any, that should be taken to avoid it. Climate change provokes such heated argument not only because of the great environmental, economic, and political implications, but in 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 connect with friends.

To help you make informed decisions about global warming, this course will explore the science and economics of climate change. We will investigate the evidence from observations and the 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? On the policy side, we'll focus on the economic costs and the political changes needed to respond to climate change. A difficult question is how to account for the inherent uncertainty of the predictions. Along the way to answering these questions, we'll learn more about the climate change research going on here at NYU. The course will culminate with a course project on current research in climate science and policy, allowing you to contribute your voice to the worldwide discussion.

Required Textbook

David Archer, 2007, *Global Warming: Understanding the forecast*, Blackwell Publishing, Ltd. 194 pp.

Additional Resources

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

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

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

Other materials and links will be posted on the course website.

Class Expectations

As this is a Freshman Honors 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 the class discussions, and conduct a term long 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 claims should be backed up with facts and sound reasoning. Unfortunately skepticism is sometimes confused with ignorance. It's equally important to give weight to all the facts and arguments, and be willing to alter one's view when the situation demands.

Course Requirements

1. **Attendance is mandatory.** Absences will be excused only in the case of an emergency, illness, or officially sanctioned university event. **If you are ill or cannot possibly make it to class, you must e-mail me ahead of time.** I know there are certain situations (such as a death in the family) when it may not be possible to contact me in advance; in these cases, please contact as soon as reasonable and we'll work things out. You are allowed 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.). Athletes, please see me in the beginning of the semester so we can make sure your athletic schedule (and the rather late time of this course) will not create a burden for you down the road.
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 two of you will be responsible for preparing a 20-25 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. Informal 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 Tuesday before class.** These are chiefly to get you thinking creatively about the text. I hope that you will be able to submit and view all the responses on our course's blackboard page. (More on this in the first few weeks of class.) I will not formally grade your responses, but they will be factored into your final grade.
4. All students will conduct a course project, detailed in the next section. It will consist of a 1 page proposal, a 5-6 page essay due during the middle of the semester, and a final paper or website of length 12-15 pages (or equivalent, for web documents) to be completed by the last class. You'll also present your project to the rest of the class at the end of the semester. In addition, throughout the semester we'll divide the class into peer reading groups to help evaluate your writing.

Course Project

The course project consists of two main components. The first is a short paper, of length 5-6 pages, where you will focus on a scientific topic related to climate change. The second is a longer paper, or possibly a wikipedia page, where you explore an element of climate change policy. To encourage you to get started, you will propose a topic early in the semester.

- 1) A topic proposal, 1-2 pages. **DUE September 23.** The goal of the research project is to explore a science and policy element of climate change. In the proposal, you should suggest a concrete idea for the science paper, and a possible idea for the policy paper.
- 2) Short paper, 5-6 pages. **First draft due October 7, final draft due October 19.** In this paper, you will explore a scientific issue related to climate change. You must read and discuss at least one 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.
- 3) Final paper or contribution to Wikipedia, 12-15 pages or equivalent. **First draft due Nov. 18, final draft due by last day of class, December 14.** The goal of the final project is to explore a single policy related issue involving climate change. I'm offering two options. One is a more traditional research paper -- a policy statement you might give to a politician charged with evaluating possible strategies. The other option would be to contribute a webpage to the wikipedia commons. The standards would be equivalent in both cases; your work must be properly placed in context and cited, and you must use at least two recent scientific or economic studies. The idea of using wikipedia is that it might help turn your project into something more lasting; the need to pick something new, however might limit the flexibility in topics. 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. With this assignment, it is critical to maintain a quantitative, scientific approach to the problem; this will not be your personal opinion on how to respond (or not) to potential climate change. Rather, your goal is to explore the issue, presenting the best estimates of the costs and effectiveness of the outcome. 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 would New York University need to do?

Grade Policy *(approximately)*

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| Participation + Class Discussion | 30% |
| Weekly written homework | 10% |
| Mid-term Research Paper | 20% |
| Final Presentation + Discussion | 10% |
| Final Paper / Project | 30% |

Tentative Course Schedule

Additional readings will be posted on the class webpage and/or handed out in class.

| Week | Topics | Readings |
|------------|--|--------------------|
| Sept 7,9 | Introduction | The Climate of Man |
| Sept 14,16 | Radiation Basics + Layer Model | Chapters 2-3 |
| Sept 21,23 | The Layer Model + Greenhouse Gasses | Chapters 3-4 |
| Sept 28,30 | Atmospheric Temperature Structure | Chapter 5 |
| Oct 5,7 | Atmospheric Circulation | Chapter 6 |
| Oct 12,14 | Feedbacks + Carbon on Earth | Chapters 7-8 |
| Oct 19,21 | Fossil Fuels + The Carbon Cycle | Chapters 9-10 |
| Oct 26,28 | Scientific Uncertainty | Chapter 11 |
| Nov 2,4 | The Climate Forecast | Chapter 12 |
| Nov 9,11 | The Climate Debate | Chapter 13 |
| Nov 16,18 | Climate Policy | |
| Nov 23 | Climate Policy | |
| 11/30,12/2 | Climate Policy / Student Presentations | |
| Dec 7,9 | Student Presentations | |
| Dec 14 | Student Presentations | |