

**Program, Course or Contract Title:** *Energy Systems & Climate Change*  
**Quarter and Academic Year:** *Fall 2009*

In fall quarter, we studied the science of conventional energy sources, their costs and benefits, and policy options for regulating their harvest and use, in the light of global climate change. We discussed alternative and renewable energy sources less formally, and will focus on these in winter quarter. We learned how fundamental principles of physics apply to both natural and human-made energy systems. We attended the Plato Lecture series, which described climate modeling and explored a range of appropriate environmental agendas to address global climate change impacts in the 21st century. In order to gain a deeper understanding of issues involved in achieving a sustainable energy society, the program featured diverse workshops with hands-on statistical methods for data presentation.

Our primary texts for energy and climate science were *Energy, Environment, & Climate*, by Rich Wolfson (2008), the summary report for Part I of the 2007 Intergovernmental Panel on Climate Change (IPCC) and a Scientific American article summarizing the IPCC report, and articles such as those by Pacala and Socolow from Princeton's Carbon Mitigation Initiative. Our primary texts for policy were *Global Environmental Governance* by Speth & Haas, *Who Owns the Sky?* by Peter Barnes; *Apollo's Fire* by Inslee and Bracken; *Big Coal* by Jeff Goodell; and *Ending the Energy Stalemate, A Bipartisan Strategy to Meet America's Energy Challenges* by the National Commission on Energy Policy, and articles. Additional texts for seminar included *State of Fear* by Michael Crichton; *The Fine Art of Baloney Detection* by Carl Sagan; Don Finkel's chapter on community reading and writing from *Teaching with Your Mouth Shut*; *Field Notes from a Catastrophe* by Elizabeth Kolbert; and *Deep Economy* by Bill McKibben. Primary learning goals included deeper qualitative and quantitative understanding of energy and climate issues and policy approaches, and improved physics and math, critical thinking, writing and speaking, and teamwork skills.

Each faculty usually lectured and/or provided workshops once or twice per week, and we held two seminars per week. Students formed seminar teams and were expected to meet before each seminar to discuss readings and generate Points, Insights, and Questions (PIQs). They posted these online the day before each seminar, and we used them as starting points for rich seminar discussions. Each team was also expected to post PIQs for Wolfson chapters, and to facilitate seminar at least once.

Individually, students presented Brief Reports on areas of particular interest to them. This gave students early practice with research and public speaking. Students were also required to post two online responses to peers' Brief Responses.

Students formed research teams around common interests, and planned projects to be carried out in winter quarter. All research teams were required to present their research plans informally at midquarter, and formally at the end of the quarter, together with formal research papers and annotated bibliographies.

Credit for the program was also based on attendance and engagement; and on completion of assignments on time with acceptable quality, including four quantitative homework assignments from the Wolfson text, three formal essays and two responses to peers, nearly weekly responses to Plato lecture speakers, one Brief Report, weekly PIQs, the midterm exam and the final survey. The midterm exam covered conceptual physics of energy and climate, factual knowledge from readings, and concepts from *Apollo's Fire* (for policy and law). The required final survey was mostly reflective and self-evaluative, with some summative questions of fact on policy and on science of energy and climate.

**EQUIVALENCIES:**

**TOTAL CREDITS EARNED: 16**

- 4 Energy and Environmental Policy / International Law
- 4 Energy / Climate Science (algebra-based)
- 2 Response essays to lecture series on [Computer Modeling/Geo-engineering](#)
- 4 Seminar on [Conventional/Alternative Energy Sources and Policy](#)
- 2 Research Project Planning / Brief Reports on Energy Issues