Syllabus for PUBP 6354: Climate Policy

Course Description

Climate change is a global problem requiring unprecedented international cooperation and interdisciplinary investigation requiring expertise in engineering, economics, environmental studies and public policies. However, the complexity of this environmental threat, its abstract nature and the time lag between current costs and future benefits make the implementation of climate change policies very difficult.

This course aims to address the whole complexity of climate change, by bringing together the science of climate change, the analysis of impacts, and the economic and engineering strategies to reduce emissions. In this class, students will be actively engaged in exploring the scientific and economic issues underlying the threat of global climate change and the institutions engaged in negotiating an international response.

The course has no prerequisites.

In the course, we will address several important questions: What is the scientific basis of climate change? What are the sources of emissions of greenhouse gases? What would be the impacts of climate changes on human well-being and on the natural world? What can be done to adapt to climate change to reduce losses and maximize benefits? What is the optimal way to curb carbon emissions? Should we price fossil or subsidize low-carbon energy? What technologies exist or might be developed to allow us to slow climate change? What types of international and national policies have been effective so far?

Learning Objectives

The course aims to provide a set of tools to approach these and many other fundamental climate policy questions. By the end of the course, students will be well prepared to:

- Apply fundamental economic and policy tools to address climate change questions;
- Describe current climate mitigation policies around the world, their challenges and opportunities;
- Formulate policy solutions to deal with climate change as a global public good;
- Determine the role of socio-economic and technological solutions to reduce climate change impacts;
- Appreciate that climate change is a multidimensional goal with complementarities and tradeoffs between different objectives, across time and between individuals;
- Professionally navigate the debate on climate change.

Instructional strategies

Instructional strategies include these three modes of engagement:

- Active learning: In class students will connect general concepts with concrete examples. A typical class starts with a student presenting a specific item from the daily news relative to one of the topics previously discussed in class or something that interests them related to the course. In this way they elaborate and formulate questions that connect current events to the theory they were learning in their lectures. When students see how theoretical concepts could influence their own lives or something they care about, the course material becomes more relevant to them and they become more enthusiastic learners.

- Interaction and engagement: Visual and verbal interactions are key aspects of this course.
- Research and teaching: During the course, students will be exposed to some results of the instructor's current research connected with the lecture's topic. Showing them that the topics explored in the social sciences deal with current problems and there are still open questions to study will make them more interested in the subject.

Course Materials

To facilitate discussion, all reading assignments must be read before the day of discussion. Come prepared to discuss the gist of the reading materials and be able to submit brief reflections prior to class. Additional course material is posted on Canvas.

- Richard S J Tol. "Climate Economics: Economic analysis of climate, climate change, and climate policy." Edward Elgar Publishing, Aug 29, 2014. (https://sites.google.com/site/climateconomics/)
- Scott Barrett, Carlo Carraro, Jaime de Melo. "Towards a Workable and Effective Climate Regime."10 November, 2015. http://www.voxeu.org/sites/default/files/image/FromMay2014/Climate 20change%20book%20for%20web.pdf
- Intergovernmental Panel on Climate Change (IPCC), Fifth Assessment Report (AR5): https://www.ipcc.ch/report/ar5/
- U.S. National Climate Assessment (NCA): https://nca2018.globalchange.gov/
- U.S. Climate Science Special Report (CSSR): https://science2017.globalchange.gov/

Course Assessment and Grades

Class Participation	5
Quizzes	20
Climate Change Science/Policy News	10
Short Assignments	30
Final	35
Total	100

[Grading: A= 90-100%; B= 80-89.9%; C= 70-79.9%; D= 60-69.9%; F <59.9%]

Participation/Attendance

Course attendance is a primary requirement for a responsible learning experience. Punctuality is mandatory. Each student is expected to participate in the class discussion of reading. Participation requires preparation and having done assignments and readings prior to class. I expect students to come to class having read and thoughtfully considered the materials assigned. Students will be evaluated every class on their comments, questions, and arguments as follow:

A student may miss class on occasion due to medical issues. Georgia Tech has a web page that describes the expectations, rights, and responsibilities of students, instructors, the Office of Student Life, and health care providers. The information is intended to give students better direction as to how they should proceed to notify instructors when they are ill and need to miss class and what kind of documentation they should provide and to whom. Students should refer to Georgia Tech policies at the "Student Absence from Class Due to Illness or Personal Emergencies" web page at http://www.catalog.gatech.edu/policies/student-absence-regulations/

In-class Quizzes

During the course there will be unannounced in-class quizzes with questions based on the readings.

Oral Climate Science/Climate Policy news

Students will be assigned to make two oral presentations (each worth 7.5 points) on a particular news item relevant to either the science of climate change or a recent climate change mitigation/adaptation policy at the local, state, regional, national, or international level.

Short Assignments/group

Students will be responsible for submitting four 300/600-word briefs.

Assignments have to be submitted on Canvas by the due date in the schedule at 9 am. Late assignments will be penalized 1 point per day late, without prior permission from the instructor.

- Assignment 1: discuss two possible climate change impacts in Georgia - use at least one peer reviewed article and the NCA report.
- Assignment 2: discuss how the discount rate affects the overall cost/damage of climate change in the Stern Review - use at least two peer-reviewed articles.
- Assignment 3: assess the historical trend of GA emission and emissions per capita (2005-2016) and the 2016 emissions mix. What is the sector that contributes the most to CO_2 emissions in GA? Compare total emissions and emissions per capita in GA with other two states and discuss your results.
- Assignment 4: estimate your summer trip/ideal trip emissions and the effect of different carbon prices ($10, $50 and $100/tCO2) on your trip decisions. Find a possible option to offset your emissions.

Final

The final will be closed book and will include a mix of multiple choice and short answer questions. The exam will be delivered in class on the dates listed in this syllabus. The final is cumulative and covers material in the textbook and readings.

Extra Credit

Throughout the program, extra credit opportunities may present themselves. These may include opportunities to participate in research experiments, extra credit questions, etc. Students are encouraged to pursue extra credit opportunities to improve their overall class grade.

Changes in the Syllabus

The instructor periodically updates the syllabus and course content throughout the semester. Required readings beyond the textbooks, as well as supplementary readings, will be made available on Canvas. Revisions, if any, will be announced in class and posted online with at least two weeks advance notice. Always check E-mail/Canvas for updates in assignments up to 24 hours before the next class.

Honor Code

Compliance with the Georgia Tech Honor Code will be strictly enforced in the class. The Academic Honor Code is a student initiative that became an official Institute policy in 1996. The objective of the Academic Honor Code is to increase academic integrity and strengthen trust in the Georgia Tech community. Students enrolled at Georgia Tech signed an agreement acknowledging their awareness of the Academic Honor Code. They are strongly encouraged to seek a full understanding of their instructors' expectations regarding academic honor. You can find the Honor Code (with a listing of responsibilities in Sections 3 and 4) at
http://www.policylibrary.gatech.edu/student-affairs/academic-honor-code

Plagiarism

Plagiarism, fundamentally, is representing someone else's work as one's own. Reproducing (even a small piece) of someone else's text exactly, or restating someone's original ideas without attribution is strictly prohibited. It is always appropriate to cite the source or to use a quotation with proper attribution. It is also appropriate to credit any charts, graphs or other graphics (pictures, etc.) if they are not original, including when they have been slightly modified from the original.

Inclusion

The Ivan Allen College of Liberal Arts supports the Georgia Institute of Technology's commitment to creating a campus free of discrimination on the basis of race, color, religion, sex, national origin, age, disability, sexual orientation, gender identity, or veteran status. We further affirm the importance of cultivating an intellectual climate that allows us to better understand the similarities and differences of those who constitute the Georgia Tech community, as well as the necessity of working against inequalities that may also manifest here as they do in the broader society.

Students with disabilities

If you have already established accommodations with the Offices of Disability Services, please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. If you have not yet established services through Disability Services, but have a temporary health condition or permanent disability that requires accommodations (conditions include but are not limited to: mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact Disability Services at 404-894-2563 or dsinfo@gatech.edu or disabilityservices.gatech.edu. Disability Services offers resources and coordinates (with students and their instructors) reasonable accommodations for students with disabilities and/or temporary health conditions.

Weekly Schedule

Part I: Science

Lecture 1: The role of past climate observations in formulating climate policy

IPCC, AR5, WG1, pp.37-41, 46, Figure TS12

Lecture 2: Why does climate policy usually address CO2 emissions?

CSSR, Chapter 2, pp. 73-86

Lecture 3: Learning about emissions drivers for an efficient climate policy: the Kaya Identity

IPCC, AR5, WG3, Chapter 5 pp.357-360; 364-368; 371-373; 375-380

Lecture 4: What should be the goal of an international climate agreement? Future climate scenarios

CSSR, Chapter 4, pp. 133-138; IPCC, AR5, WG1, pp.102-105

Part II: Climate Change Impacts and Valuation

Lecture 5: The impacts of climate change

Tol, pp. 74-76; SPM WG2, pp. 3-7; pp. 11-14

Lecture 6: Monetary valuation to inform policy decision

*Tol pp. 76-83; Atkinson and Mourato 2008 pp. 318-325; Kotchen et al. 2017**

Lecture 7: The damage functions

Diaz and Monroe 2017, Table 1 and Figure 2; Hsiang et al. 2017

Lecture 8: The damages of future changes in climate and the equity dimension

Tol 2018, pp. 1-10

Part III: Climate Policy

Lecture 9: Living in a changing climate? Adaptation policies

Mendelsohn 2000 pp.583-591; Tol, Chapter 12; Hinkel et al. 2014

Lecture 10: Reducing emissions: where?

IPCC, AR5, WG3, SPM (pp. 17-25)

Lecture 11: The cost of reducing emissions

McKinsey 2007 pp. 26-36

Lecture 12: Emissions reduction and the efficient solution (CBA)

Stern (2006); Nordahus (2007)

Lecture 13: The role of time and the social discount rate

Atkinson and Mourato 2008 pp. 330-332; US Council of Economic Advisers, 2017 pp.3-9

Lecture 14: Climate policy decisions should use the global social cost of carbon, why?

National Academy of Science, 2017, pp. 9-15; Nordahus 2017 (tables 1,2,3); Revesz et al. 2017 p.2 only; Fraas et al. 2016 p.1

Lecture 15: The economics of Climate Change

Nordhaus (1999)

Lecture 16: Policy instruments for climate policy: efficiency vs. cost-effective

Goulder and Parry (2008) (pp. 152-159; 166-171)

Lecture 17: Meeting Pigou and Coase

Stavins (2011) (pp.94-103); Keohane and Olmstead (2007)

Lecture 18: Quantity and price-based under uncertainty: The Weitzman Theorem

Tol 2014 pp. 54-57

Lecture 20: Trade and Climate: trade of emissions or trade of goods?

IPCC, WG3, Chapter 5 pp. 373-375; Steininger et al. 2018

Lecture 21: Climate Policy in an interconnected world: Policy instruments and Paradox
Reference: Barrett et al. (2015) pp. 297-309; Jensen et al. (2015) pp.1-2

Part IV: Real World Climate Policies

Lecture 22: The evolution of the international climate change
*Bodansky et al. (2017) pp. 2-16; 17-21; 26-29; Bodansky (2001)**

Lecture 23: The Kyoto Protocol
Shishlov et al. (2016)

Lecture 24: The Paris Agreement
Rogelj et al. (2017); Paris Agreement; CSSR, Chapter 14

Lecture 25: Climate Finance
Barrett et al. (2015), chapter 16

Lecture 26: Future climate policy architecture and the role of geoengineering
Bodansky et al. (2017) pp. 22-26; Barrett et al. (2015) pp. 355-361

Lecture 27: National climate policies around the world
World Bank (2017) pp. 22-34, Figure 10

Lecture 28: Climate policy in the Trump era
Barrett et al. (2015) pp. 143-147; 240-244

Lecture 29: Why people don't believe in science?
Campbell and Kay (2014)

Lecture 30: The European and the California Emissions Trading Schemes: learning from the experience
Schmalensee and Stavins 2017 pp. 578-582

Part V: Sector-specific climate change mitigation

Lecture 31: The power sector: cleaner energy, nuclear energy, zero energy?

IPCC, AR5, WG3, Chapter 7 (pp. 554-559)

Lecture 32: Uber, zipcar, EV or public transportation?

IPCC, AR5, WG3, Chapter 8 (637-641)

Lecture 34: More forests for climate mitigation: pro and cons

Betts 2000; Kindermann et al. 2008

Lecture 35: Food: our diet, our carbon footprint?

Vermeulen et al. (2012); Scarborough et al. 2014; nyt.com

Final

* optional readings