In other studies you go as far as others have gone before you; and there is nothing more to know; but in a scientific pursuit there is continual food for discovery and wonder.
--Mary Shelley, Frankenstein

Now here we go dropping science dropping it all over
Like bumping around the town like when driving a Range Rover
Expanding the horizons and expanding the parameters
I’ve been dropping the new science and kicking the new knowledge
An M.C. to a degree that you can’t get in college
--Beastie Boys, “Sounds of Science”

Overview
Think about what you ate for breakfast, took to cure a cold, drove to work, or communicated to a friend: is there any part of your social, medical, political, and personal world that is not transformed and challenged by science and technology? Global Scientific Controversies will explore the social and ethical dimensions of controversial issues in science, technology, and medicine, particularly as science has become increasingly interconnected, intercultural, and ‘globalized’ in modern life. Now more than ever, ordinary citizens are being asked to pass judgment on controversial matters of public policy related to science and society: what to do about climate change, how to govern reproductive rights, how to treat global epidemics, how to grapple with surveillance technologies and the explosion of big data on individuals.

Science, then, is a fundamentally human experience. In this course, students will learn to think critically about differing viewpoints, explore controversies, and find common ground between social and technical concerns, all while sharpening their written and oral communication skills in a small-sized, active learning environment. While the course builds on key insights from science and technology studies (STS), an interdisciplinary field which examines the production, distribution, and impacts of scientific knowledge and technological systems, in this course we will primarily learn to think like geographers because of their disciplinary dwelling at the interface of humans/environment and science/policy. Students equipped with these skills will gain a solid foundation for eventual careers in journalism, science education, medicine, law, government, health, nonprofit management, and public policy. This course will fulfill the Geography major/minor requirements for Regional/Synthetic Geography. Welcome!
Learning Objectives (Goals of the Course)
By the end of this course, students will be able to:

- Describe and summarize the operative concepts, events, and paradigms in the history and global development of science and technology;
- Characterize and critically examine the role of human and social values in scientific discovery, decision-making, and conflicts;
- Understand and demonstrate the increasingly global nature of scientific knowledge and discovery, with attention to the diversity of human experience;
- Develop, revise, and self-evaluate a writing portfolio, and in the process produce new and unexpected connections across the literature.

Highlights
- Smaller-scale (50 students), interactive classroom setting with dynamic mix of lecture and in-class discussion on controversial issues in science and technology. There are no separate discussion sections; we will do all our talking right in class.
- Readings (a mix of scientific articles, news articles, and nonfiction books) will be thought provoking, affordable, and draw on cutting edge scholarship and science journalism. No textbooks in this course!
- Assignments are writing-based or mini-oral presentations, with a cumulative portfolio composed of your best products; no scantrons or multiple choice exams in this course.

Description of Proposed Topics and Learning Activities
The course is organized into five different ‘modules’, each lasting about 2 weeks, which are distinct in ‘theme’ but progressively build skills in basic knowledge, thinking abilities, and group deliberation. For each module, students will produce a written or oral ‘product’—sometimes individually, sometimes in small groups—that takes a persuasive stake on the controversial issue at hand. Over the course of the term, students will have the opportunity to ‘revise and resubmit’ their works, culminating in a final ‘portfolio’ that displays their best products and outcomes.

Module 1: Science in Action
Focus on key social, cultural, and values issues raised by contemporary scientific and technological developments through STS interdisciplinary lens that encompasses historical dimensions (e.g., legacy of scientific revolution); technological impact (e.g., affordances of new tools and media); economic and management aspects (e.g., business models, design and engineering strategies); legal and ethical elements (e.g., intellectual property, social justice); and societal response and participation (e.g., media coverage, forms of activism).

Module 2: That Sexual Feeling: Gender, Population, and Women in Science
Explores the intimate relations between gender and science. Topics include the biological and cultural construction of sexual difference, the role of women as practitioners of science, and feminist approaches to science and medicine, all grounded in the social history of birth control.

Module 3: Vectors of Colonialism: Global Disease Epidemics
What can one man accomplish, even a great man and brilliant scientist? Although every town in France has a street named for Louis Pasteur, was he alone able to stop people from spitting, persuade them to dig drains, influence them to undergo vaccination? Bruno Latour argues that the triumph of the biologist and his methodology must be understood within the particular historical convergence of competing social forces and conflicting interests. Yet Pasteur was not the only scientist working on the relationships of microbes and disease. How was he able to galvanize the other forces to support his own research? Latour shows Pasteur’s efforts to win over the French public—the farmers, industrialists, politicians, and much of the scientific establishment

Module 4: Carbon Sink or Source? Climate Change Science in the Amazon

A fundamental challenge of modern biology is to understand how information encoded in the genes of organisms drives higher-order processes in biogeochemical cycles – to learn, in other words, how to ‘scale’ from genes to ecosystems. A parallel challenge of earth system sciences is to understand, and ultimately manage, how earth systems interact with climate and environmental variation at multiple scales. Addressing these challenges is exceptionally urgent in the Amazon basin – which contains over half of the world’s remaining tropical forest, over 10% of all described plant and animal species on Earth, the largest freshwater bodies in the world, and a storehouse of over 100 billion metric tons of carbon – and where deforestation is dramatically altering the effects of global climate change.

Yet the scaling of environmental processes – from microbial to global – remains problematic in the Amazon basin, which itself has become the object of intensive development and international scientific inquiry. For example, in the late 1970s, debates over the environmental impacts of Amazon deforestation and pasture conversion revealed how politicized interpretations of microbial processes in soil (i.e. that peasant farming degraded the soil more intensively than large-scale ranching) were used to promote regional, export-oriented policies. Despite calls for greater parity among large-scale scientific endeavors in developing countries, most studies posit the integration of scientific knowledge as a technical matter rather than a fundamentally social or even cultural issue. The urgent need for understanding the science of interdisciplinary science prompts a key empirical question: At what scales do scientists understand carbon and water cycling, how is scalar knowledge influenced by social and behavioral factors, and with what implications for integrating environmental knowledge? In this module, we will explore debates over whether the Amazon is a carbon ‘sink’ or ‘source’, and how scientific knowledge – produced by an increasingly international cadre – moves across the science-policy interface in critical countries like Brazil.

Module 5: Climategate

Here we explore the ethical dimensions of climate change. These include the discovery of global warming over two centuries, the rise of secular and religious denialism and skepticism toward the scientific consensus on it, the dispute between developed and developing countries over how to forge a binding global agreement to mitigate it, and the role morality of various actors (scientists, politicians, fossil fuel companies, the media and ordinary individuals) in the US and abroad in assessing ethical responsibility for the problem and its solutions. Special focus on the recent controversy (in 2010) popularly called “Climategate”.