GEOG 8901 Seminar: Global Warming and Climate Change

Fall, 2019 (Aug.20th – Dec. 4th)

Course Syllabus

Instructor: Prof. Zhengyu Liu
Time: TH: 3:00pm-5:48pm
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Course Prerequisites
Atmospheric Sciences 5950 (for climate science students) or permission of the instructor

Course Objectives
Global warming has emerged as one of the most challenging issues of our society. Any effort to deal with global warming requires a thorough understanding of several fundamental questions: *Is global warming happening? Is global warming caused by human activity? How will climate change in the future?* In this course, we will learn some fundamental knowledge of the climate science relevant to these questions. The course is designed for students with backgrounds in climate sciences as well as across interdisciplinary fields related to climate sciences, such as earth science and paleoclimatology, environmental science and sustainability, policy and human dimension. The level of students can range from senior to advanced graduate levels. All students will be introduced with some fundamental knowledge on climate change sciences. Each student will then have the opportunity to pursue deeper into one or two topics of his/her interest. For the students with climate science background, they will further examine scientific issues on the mechanism of climate change. For students not specialized in climate sciences, they will learn some basic facts, scientific issues and potential uncertainties of global warming, as well as the potential relation with his/her field of study. Either group of students will also learn from their peers of the other group as a part of the interdisciplinary study in this course.

Course Structure
The class will meet once a week for two 80-minute sessions, with a 20-minute break in the middle. In the first few weeks, the lecturer will introduce basic scientific concepts on climate change and global warming. In the meantime, each student will select one or two topics of his/her interest and the corresponding sections/subsections on the current IPCC report. Each week, one student will give a presentation on the topic in the first session. The entire group and the lecturer will join in the student for the discussion in the second session. The topic of presentation will be chosen based on the interest of each student. The presentation will be evaluated based on either its technical aspect related to climate sciences or its interdisciplinary relevance to climate change sciences, including implication to earth's past changes, environmental issues and policy making.

Textbook

AR5 Climate Change 2013: The Physical Science Basis, IPCC (Working Group I report)

https://www.ipcc.ch/report/ar5/wg1/

Grading

The student will be graded based on the lecture/presentation (60%) and classroom participation and discussion (40%).

Potential Topics

1. Scientific principles on global warming
2. Observations on global warming
3. Atmospheric responses
4. Oceanic responses
5. Terrestrial ecosystem response
6. Carbon cycle and global warming
7. Past climate change
8. Future projection on global warming