### CP 6217: CLIMATE CHANGE AND THE CITY

Georgia Institute of Technology, Spring 2016

T/TH 1:35 – 2:55pm

Rm. 309, Arch East

Instructor: Brian Stone

Office Hours: Tuesdays 11:00 – 12:00pm or by appt.

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**Overview** Argued to be the most enduring of all human inventions, the city has proven remarkably resilient in the face of catastrophic weather events, severe economic disruption, devastating human epidemics, and prolonged warfare. Yet, as the longstanding environmental stability of urban regions is altered through climate change, the structure and management of the contemporary city must adapt to these changing conditions if it is to persist in a warming world. To this end, this course explores the fundamental challenges to the city posed by climate change and the range of policy and design-based responses available to anticipate and respond to these challenges. The objectives of the course are to understand the physical mechanisms through which climate change is modifying urban environments and, in turn, how cities amplify these changes; to consider the range of current and proposed policy strategies to manage climate change in cities; and to examine and develop design-based tools for climate change adaptation at the urban scale.

In the first component of the course, the physical drivers of climate change at the global and regional scales will be presented to provide students with a theoretical basis for the development of climate management policies and strategies. Particular emphasis will be placed on the present state of the consensus science, observed climate trends, and on tools employed in climate modeling. The second component of the course will examine international to local policy responses to climate change, with an emphasis on local scale hazard mitigation and post-disaster recovery planning. The concluding course component will entail a case analysis of climate management in post-Katrina New Orleans, explore emerging climate adaptation strategies, and provide students with the opportunity to develop climate change adaptation plans for New Orleans neighborhoods.

#### Evaluation Students will be evaluated on four tasks: (1) class participation and a topic presentation; (2) two policy briefing memos; (3) a midterm examination; and (4) a final project entailing the development of adaptation strategies for a selected city. A description of each requirement and its relative weighting in grading follows.

#### Discussion Participation and Topic Presentation: Class sessions will consist of lecture material, discussion, and topic presentations. Students are expected to come to each class well prepared to discuss and evaluate the assigned reading material. Each student will have the opportunity to develop a formal presentation on an identified discussion topic to be covered during a class session. For each presentation, students will be allotted 15 minutes in which to deliver a well-structured Power-Point presentation on an applied project or historical event related to the day’s central theme. Student presentations will be evaluated on content, organization, visual quality, creativity, and delivery. Each student is expected to schedule a meeting with me to discuss the presentation at least one week in advance of the assigned date. (20%)

#### Policy Briefing Memos: Students will have the opportunity to explore policy-related issues in detail through the development of two, 2-page briefing memos related to climate management in cities. Each student will select a memo topic from a list (or propose their own), draft the memos, and present them to the class on dates designated in the syllabus. The purpose of the assignment is to further develop professional writing and communication skills, topics that will be explored through a lab session on memo writing. (15% per memo)

#### Examination: Students will have the opportunity to demonstrate their comprehension of course concepts and themes through a single midterm examination. The midterm exam will cover the first and second components of the course exam and will adopt a short answer format. (20%)

Adaptation Plan: The final project for the course will entail the development of an adaptation plan focused on the management of sea level rise and extreme heat in a neighborhood in New Orleans, LA. Each student will identify urban zones where exposure to flooding or extreme heat is most acute, assess associated population vulnerabilities, summarize the problem and array of proposed management strategies in a project paper, and present recommendations to the class during the last week of the term. (**30%**)

Please note that all written assignments (unless otherwise noted) are to be submitted through the “Assignments” tab in T-Square. Late submissions will be discounted a letter grade a day. It is the student’s responsibility to ensure that assignments submitted through T-Square are successfully uploaded into the system.

The Institute policy regarding student plagiarism will be strictly enforced. It is expected that all students have a thorough understanding of the various forms of plagiarism and that questions pertaining to this policy will be resolved before the submission of any assignment. For a description of proper attribution, please see the School of City and Regional Planning “Academic and Professional Writing Guide,” available through the class T-Square site. Any student found to violate the policy on plagiarism will receive a failing grade for the assignment and will be subject to disciplinary action as outlined within the Institute‘s Honor Code.

Students with disabilities needing academic accommodation should provide documentation to the Office of Disability Services, disabilityservices.gatech.edu, and bring an accommodation letter to the instructor indicating the nature of accommodations required.  This should be done within the first week of class or as soon as possible after a new disability condition arises.  All effort will be made to provide reasonable accommodation

**Learning** This course is structured around the following learning objectives: 1) mastery of fundamental

**Objectives** principles of urban climatology; 2) introduction to international to local climate management policy; 3) introduction to hazard mitigation planning; and 4) instruction in policy memo writing.

**Texts** Schwab, J. 2013. Hazard Mitigation: Integrating Best Practices into Planning. Washington, DC: The American Planning Association, Report # 560.

Stone, B. 2012. The City and the Coming Climate. New York: Cambridge U Press.

Course Reader – assignments denoted by (R) and available through T-Square.

Texts may be acquired through most any online retailer or directly from the publishers, The American Planning Association (Schwab) and Cambridge University Press (Stone). All other readings, as well as other course materials, are available as Adobe files through the course website: <http://tsquare.gatech.edu>

**I. PHYSICAL BASIS FOR CLIMATE CHANGE**

## **January 12:** Course Overview

## **January 14:** From Bell Jar to Greenhouse: Atmospheric Drivers of Climate Change

Stone, Prologue & Chapter 1: Keeling’s Curve

Richter, B. 2010. Beyond Smoke and Mirrors: Climate Change and Energy in the 21st Century. New York: Cambridge: 16-33 (R)

**January 19:** Professional Memo Writing

Ryan, K. 2003. Write up the Corporate Ladder. New York: Amacom: 15-28 & 51-88 (R)

**January 21**:Rabbits & Oranges: Land Surface Drivers of Climate Change

Stone, Chapter 2: The Climate Barrier

**January 26**: Climate Modeling and Urban Scale Drivers of Climate Change

Richter, B. 2010. Beyond Smoke and Mirrors: Climate Change and Energy in the 21st Century. New York: Cambridge: 34-46 (R)

Schneider et al. 2010. Climate Change Science and Policy. Washington DC: Island Press: 23-27 (R)

Stone, Chapter 3: Islands of Heat

Discussion Topic: NYC Urban Heat Island Study

**January 28**: Climate Change and Water

Schneider et al. 2010. Climate Change Science and Policy. Washington DC: Island Press: 66-81 (R)

Discussion Topic: Sea Level Rise and Disappearing Islands: Planning for Retreat

**February 2:** No class

**February 4**: Climate Change and Extreme Weather

US National Climate Assessment. 2014. Extreme Weather, Hurricanes, and Storms sections: <http://nca2014.globalchange.gov/report/our-changing-climate/extreme-weather>

Richardson. When the end of civilization is your day job. Esquire Magazine: July 2015 (R)

**February 9:** No class

**February 11**: Climate and Health: Is Your City Killing You?

Klinenberg, E. 2013. How can cities be climate-proofed? The New Yorker, January: 12 pp (R)

Schneider et al. 2010. Climate Change Science and Policy. Washington DC: Island Press: 124-130 (R)

Discussion Topic: 1995 Chicago Heat Wave: Lessons Learned

**II. climate policy: global to local**

**February 16**: Kyoto and COPS: The International Policy Regime

Schneider et al. 2010. Climate Change Science and Policy. Washington DC: Island Press: 221-234 (R)

Stone, Chapter 5, 127-147

Discussion Topic: Open Topic

**February 18:** Policy Memo Presentations

Topics

IPCC 5th Assessment Report: What a Mayor should know

The Copenhagen COP: What went wrong?

The Paris COP: Are we saved?

The Stern Report: What a Mayor should know

Open topic(s)

**February 23:** Policy Memo Presentations and Adaptation Project Overview

Topics

Climate Change and Cities First Assessment Report: What a Mayor should know

What is ICLEI and how can a Mayor capitalize on this organization?

Reducing Emissions from Deforestation and Forest Degradation: REDD, REDD+, and

how forestation Programs can mitigate carbon emissions

Chicago’s Climate Action Plan: A good model for Atlanta?

Open topic(s)

**February 25**: Mitigation through Technology

Schneider et al. 2010. Climate Change Science and Policy. Washington DC: Island Press: 423-455 (R)

Bulkeley, H. 2013. Cities and Climate Change. New York: Routledge, 106-141 (R)

Discussion Topic: The Renewables Revolution: What Technologies are most Promising for Carbon Reductions?

**March 1:** Guest Lecture: Climate Change and Disease Transmission in Cities

*Speaker: Dr. Gonzalo Vasquez-Prokopec, Department of Environmental Studies, Emory University*

Vasquez-Prokopec, G. et al. 2010. The risk of West Nile virus infection is associated with combined sewer overflow streams in urban Atlanta, GA, USA. Environmental Health Perspectives, 118: 1382-88 and Supplemental Material (R)

**March 3**: Local Climate Policy: Adaptive Mitigation

Stone, Chapter 5, 147-169

Bulkeley, H. 2013. Cities and Climate Change. New York: Routledge, 71-105

Discussion Topic: Cool Roofing in Los Angeles: A New Mandate

**March 8**: Local Hazard Mitigation Planning

Schwab, Hazard Mitigation, Chapters 1-3

Discussion Topic: Modernizing the National Flood Insurance Program: Recent Legislative Changes

**March 10**: Local Hazard Mitigation Planning – Post-Disaster Response and Recovery

Schwab, Hazard Mitigation, Chapters 4-5

Schwab et al., Planning for Post-Disaster Recovery and Reconstruction. Chicago, IL: American Planning Association, 3-41

Discussion Topic: Watershed Management in Atlanta: Planning for the Next Drought

**March 15**: Exam

**March 17**: Movie Night:Trouble the Water

**March 22 & 24**: Spring Break

**III. URBAN climate adaptation and Resilience**

**March 29:** Introduction to Katrina Case Study

Seidman, K. 2013. Coming Home to New Orleans: Neighborhood Rebuilding After Katrina. New York: Oxford University Press, 18-59.

Verchick, R. 2010. Facing Catastrophe: Environmental Action for a Post-Katrina World. Cambridge, MA: Harvard University Press, 128-163 (optional)

Discussion Topic: Katrina Diaspora: What Changes in Regional Demographics Tells us about Climate Migration

**March 31**: Policy Memo Presentations

Topics

Hurricane Katrina: Why did the levees fail?

Disaster post-mortem: How well did the emergency response system perform during Hurricane Katrina?

Post Katrina New Orleans: What community rebuilding strategies have worked?

How is green infrastructure incorporated into post-Katrina resilience planning?

Open topic(s)

**April 5**: New Orleans Trip Overview and Policy Memo Presentations

Topics

What lessons for resilience planning were learned from Hurricane Sandy?

Preparing for critical infrastructure failure: How to increase resilience of transportation

systems to extreme weather?

Responding to West Nile Virus in Dallas, TX: What actions can government take?

Open topic(s)

**April 7**: Class Trip to New Orleans

**April 12**: Adaptation to Sea Level Rise

Plan NYC. 2013. A Stronger, More Resilient New York, 38-65

Rich, N. The Most Ambitious Environmental Lawsuit Ever. NY Times, October 3, 2014, 24 pp.

Discussion Topic: Open Topic

**April 14**: Adaptation to Extreme Heat

Stone, Chapter 4

Smith, P. 2010. Building for a Changing Climate. London: Earthscan, 41-52

Discussion Topic: Extreme Heat Response Planning in Europe: Lessons from the 2003

Heat Wave

**April 19**: Adaptation to Other Extreme Weather & Geoengineering

Schwab, Chapter 6 & Chapter 9

Discussion Topic: Open Topic

**April 21**: Adaptation through Social Resilience

Aldrich, D. 2012. Building Resilience: Social Capital in Post-Disaster Recovery. Chicago: Chicago University Press, 130-147.

**April 26 & April 28**: Adaptation Project Presentations