

*Draft 2/28/2012*

## **425.630 – CITIES AND CLIMATE CHANGE**

### **Class Syllabus and Related Information**

**Spring 2012**

1717 Massachusetts Ave., Washington DC, Room 212

Instructor: Dr. Miriam Heller

Thursday 6:00 – 9:00 pm

This course examines cities as the primary sources of energy demand; the major contributors to climate change; the most vulnerable loci to climate change impacts; and the logical focal point for assessing, designing, and implementing climate mitigation and adaptation solutions. After characterizing energy demand and climate change in the urban context, sector-specific options for alternative energy production, resilient water systems, green buildings, energy efficient transport and sustainable infrastructure generally will be explored. Local level government climate policy options that cut across these sectors are examined, including land use, transportation planning, building practices, financing, local level offsets and urban-based Clean Development Mechanisms. Analytical methods for assessing the vulnerability and risk of various socio-technical solutions to climate change in support of evidence-based policy making will be covered at a mathematically accessible level. The course is meant to provide a solid framework, broad overview and rich set of references for future pursuits involving urban climate change.

### **LEARNING OBJECTIVES**

Students will understand and/or know about:

- Cities as complex systems of systems that transform energy and materials into accessible products, services and waste bi-products.
- Indicators used to characterize and compare city performance.
- Similarities and differences between policies and institutions addressing development, disaster risk reduction management, and climate change adaptation.
- Methods for analyzing and assessing socio-technical solutions to urban energy and climate change issues.
- Urban sectoral subsystems and their contributions to and potential for mitigating city-wide energy demand, GHG emissions, and vulnerability.
- Projected climate change impacts to specific sectors and be familiar with potential adaptation measures.
- Climate Action Plans and Adaptation Plans at the city level.
- Significant reports, case studies and papers on cities and topics above.

### **COURSE REQUIREMENTS**

Regular class attendance, preparation of assigned readings, and active engagement in class discussions are expected and required. Several brief written assignments and problem sets will be required for class discussion during the semester. Students alone or preferably in groups will prepare a term project report focusing on a topic of your choosing (that may build on earlier assignments) and present the projects in the last class.

### **ASSESSMENTS**

Final term grades will be based on the following percentages:

- Class participation and reading assignment discussion (20%).
- Small problem sets and case studies/policy analyses with a short presentation (40%).

- Final group project: paper and presentation (40%).

**Case studies and policy analyses** will yield the best insight into the broad and evolving area of cities and climate change. To exploit these approaches, each of the modules 3-8 of the course will have associated with it four case studies or policy analyses (cs/pa). Each student will prepare two of these, write a 1-2 page brief on each and give a short presentation of in class.

## **ACADEMIC INTEGRITY**

Any work prepared or presented in this class must comply with Johns Hopkins University's high standard of conduct for academic integrity. The copying or use of others' work without proper attribution and citation as part of any class assignment is plagiarism. Any incidence of plagiarism or other instances of academic misconduct will be dealt with in accordance with Johns Hopkins University policies without any initial warning. Please familiarize yourself with The Code of Conduct for Johns Hopkins Zanvyl Krieger School of Arts and Science Advanced Academic Program located at [http://advanced.jhu.edu/bin/s/u/AAP1101\\_CodeofConduct.pdf](http://advanced.jhu.edu/bin/s/u/AAP1101_CodeofConduct.pdf).

## **REFERENCES**

**Course "Textbook"**: Rosenzweig, C., Solecki, W. D., Hammer, S. A. & Mehrotra, S. (2011). *Climate Change and Cities: First Assessment Report of the Urban Climate Change Research Network* (1st ed.). Cambridge University Press.

**Supplemental readings including case studies and policy-oriented documents** will be available as assigned on BlackBoard or the zotero Group: Cities and Climate Change. Zotero is completely optional, but will offer a more extensive set of references, not all of which will contain or provide access to full documents You will be sent an invitation to join zotero and a pointer to getting started with the software. Access is granted to zotero once you accept the invitation.

## **CONTACT INFORMATION:**

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Office hours: By appointment only by phone, skype or in person at 1717 Massachusetts avenue 30 minutes before class.

*(Tentative Course Schedule follows)*

**COURSE SCHEDULE (Tentative)**

Module	Date	Topics	Reference Materials / Assignments* (R=required; S=supplemental reading)
0	1/26/12	<ul style="list-style-type: none"> <li>• Course overview</li> <li>• Urban climate change in context</li> </ul>	R: Rosenzweig et al. (2011) pp xv-81
1	2/2-23/12	<ul style="list-style-type: none"> <li>• Framework for analysis, definitions, methods, and tools</li> <li>• Urban climate: processes, trends, projections</li> </ul>	
2	3/1/12	<p><i>Guest speaker: William Bertera, Exec. Director, ISI</i></p> <ul style="list-style-type: none"> <li>• Climate change &amp; urban energy systems <ul style="list-style-type: none"> <li>○ Technology overview, market structure and governance</li> <li>○ Energy use, GHG measurement, LCA</li> <li>○ Climate risks and energy systems</li> </ul> </li> </ul>	R: Rosenzweig et al. (2011) pp 83-111
3	3/1/12 3/8/12	<ul style="list-style-type: none"> <li>• Climate change and urban water, wastewater, flooding <ul style="list-style-type: none"> <li>○ Sector description</li> <li>○ Urban water systems vulnerability to climate change Mitigation and adaptation options</li> </ul> </li> </ul>	R: Rosenzweig et al. (2011) pp 113-143
4	3/15/12 3/15/12	<ul style="list-style-type: none"> <li>• Climate change and urban transport <ul style="list-style-type: none"> <li>○ Description of urban transport</li> </ul> </li> </ul> <p><i>Guest speakers: Holger Dalmann, Dir. &amp; Darío Hidalgo, PhD, Dir. Research &amp; Practice – World Resources Institute</i></p> <ul style="list-style-type: none"> <li>○ Role of transport in climate change and mitigation options</li> <li>○ Adapting transportation systems to a changing climate</li> </ul>	R: Rosenzweig et al. (2011) pp 145-177
	3/22/12	<i>No Class – Spring Break</i>	
5	3/29/12	<ul style="list-style-type: none"> <li>• Climate change and buildings in cities <ul style="list-style-type: none"> <li>○ Energy, water and materials use, GHG emissions, heat island effect</li> </ul> </li> </ul> <p><i>Guest speaker: Brendan Owens, V.P., LEED Technical Development, USGBC</i></p> <ul style="list-style-type: none"> <li>○ Mitigating and adaptation options</li> </ul>	R1: (UNEP, 2009a) R2: (Pew Center - C2ES, 2011)
6	4/5/12	<ul style="list-style-type: none"> <li>• Climate change and buildings in cities</li> <li>• Cross-sector, integrative issues <ul style="list-style-type: none"> <li>○ Land use and urban form</li> <li>○ Smart growth</li> </ul> </li> </ul>	R: Rosenzweig et al. (2011) pp 217-248
7	4/12/12	<ul style="list-style-type: none"> <li>• Smart Cities <ul style="list-style-type: none"> <li>○ Smart Buildings, Grids, Transport</li> </ul> </li> </ul> <p><i>Guest speaker: Smart Growth or Cities</i></p>	
8	4/19/12 4/26/12	<ul style="list-style-type: none"> <li>• Financing, other policy issues and governance challenges</li> <li>• Review and course wrap up</li> </ul> <p><i>Guest speaker: Miriam Erikson, J.D. Swydan Erickson LLC</i></p>	R: Rosenzweig et al. (2011) pp 249-269
	5/3/12	<i>Final Project Presentations</i>	

\*\* Supplemental readings (including case and policy studies) will be updated regularly.