

Urban Ecology GE 475/675
Fall 2013 Syllabus
Fridays: 2-5 pm

Instructors

BU -

Professor: Lucy Hutyra, CAS 439C

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Office Hours: Monday 1-3pm

NCSU -

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Office Hours - T 3-4, or by appointment

BU Location: CAS 132

Course description:

This course explores the biophysical environments and ecology of urban settlements. Key topics we will cover include the physical environment (particularly climate & water), patterns in human population growth and development, ecosystem structure and function (net primary productivity, soils, nutrient cycling, organismal populations), global change (urban growth, disturbance, climate change), urban environment pollution and management (air and water quality), and sustainable urban development policies and regulations. My approach in this course will be to facilitate your learning through a combination of lecturing, discussion, and guest lectures. This course will be taught in coordination with several other Urban Ecology courses across other Universities. The weekly live online guest lectures will bring the students from across different campuses together for discussion. In addition, blogs will be used as a within class and across university discussion tool. The course will include some field work within different urban ecosystems as an important way see and experience how urban ecosystems are structured and function.

Required Readings:

Required Textbook - Adler and Tanner (2013) Urban Ecosystems - Ecological principles for the built environment

Weblink - <http://www.amazon.com/Urban-Ecosystems-Ecological-Principles-Environment/dp/0521746132>

Online Cost - \$62.94 (kindle edition \$45)

All other required readings will be shared on moodle/the wiki page.

Due Dates, Make-Ups and Absence

Work must be turned in on time. LATE WORK WILL BE ACCEPTED, BUT THERE WILL BE A 50% LATE GRADE PENALTY. Each student is allowed one unexcused absence after which the participation grade will be reduced by 5% for each additional unexcused absence.

Collaboration

All work prepared for this course must be prepared by you as an individual without collaboration (unless you are explicitly directed otherwise by the teaching staff).

Originality of Work

All work prepared for this course must be written in your own words and prepared specifically for this course. You may not copy phrases, sentences, or paragraphs in written work from ANY source without quotes and specific attribution. This includes web sources. Copying will result in a 0 grade and repeated copying will be considered academic misconduct.

Assessment:

All students are expected to attend all lectures, participate in class discussions, complete all assigned reading **before** class, and write and present a term project. Undergraduate student papers are expected to be 8-10 pages in length. Graduate student papers are expected to be 10-12 pages in length and include a novel data analysis component. The instructor will be available during office hours to assist with student data analysis.

Grades will be assigned based on the student's performance on the following:

- 15% - 3 Homework assignments (5% each)
- 15% - Midterm exam
- 15% - Weekly blog posts & participation in class and during the paper discussions
- 20% - Final Exam
- 35% - Term paper (25%) & presentation (10%)
 - Final term paper due electronically on December 11th by 6pm.

The topic of the term paper can be anything related to the course. Examples of paper topics could include (not a comprehensive list):

Urban environment justice / Ecological impacts of urban landscaping choices / Urban wildlife habitat / Urban nitrogen deposition / Urban metabolism / Urban greenhouse gas budgets / Consequences of urban land cover expansion / urban heat island impacts / urban greening efforts / green roofs / Changes in terrestrial biogeochemistry across urban to rural gradients / Urban agriculture / What is urban sustainability?

Lecture & Reading Schedule:

Note this the schedule below reflects both the BU & NCSU class meetings. The BU class will not meet until September 6th. BU class meetings will run from 2-5pm. NCSU classes are from 1-4. Portions of most class meetings will be conducted jointly, with our expert guest lectures and discussions running from 2:30 – 3:50. There will be a 10-minute reflection/review time after each discussion.

Week	Friday Class	Speaker (2:30 – 3:50 EST)	Class topic NC State ONLY BU ONLY Both NCSU + BU	Reading/Media/Prep Material (notes)
1* NO CLASS	August 23	NO CLASS		NCSU courses officially start this week but we will not have class
2* NCSU ONLY	August 30	No guest speaker	Intro to Syllabus, Socio-Ecological Systems – Interdisciplinary Science	Collins et al. 2011, Grimm et al. 2008, Pickett et al. 2011 Adler & Tanner - Chapter 1
3* NCSU	Sept 6	No guest speaker BU/NCSU class Introductions	(1) Drivers of Urban Cover – Homogenization of Urban Ecosystems (2) Urban Ecology in a Developing World – “Rural is the New Urban”	(1) Bigsby et al., in Press (2) McHale et al., Frontiers
3* BU	Sept 6	No guest speaker BU/NCSU class Introductions	Intro to syllabus, What is urban ecology?	NPR Science Friday 'Urban Ecology' Adler & Tanner - Chapter 1 Collins et al. 2011 Grimm et al. 2008, Pickett et al. 2011 Liu et al. 2007
4	Sept 13	Kirsten Schwarz (Spatial distribution of environmental goods and hazards)	Urban Ecosystem Accounting	Adler & Tanner Chapter 2 Kennedy et al. 2011 Golubiewski 2012a Kennedy 2012 Golubiewski 2012b
5	Sept 20	Laura Ogden (Theory & the city)	Urban form, structure, & function Grey to green	Sassen & Natan (2011) <u>Optional:</u> • William (1975)

			infrastructure ecology	Sassen (2001)
6	Sept 27	Steward Pickett (Urban Ecological Principles/Urban Transformations)	Urban Ecosystem Processes	Adler & Tanner Chapter 3 Pickett et al. 2011
7	Oct 4	Paige Warren (Ecology, Evolution and Behavior of Urban Biota)	Ecology of urban organisms	Adler & Tanner Chapter 4 Hope et al. 2003 Marzluff et al. 2005
8* BU ONLY	Oct 11	Private class – invited guest not needed	Urban climates & Soils	Zhang et al. 2004 Kalney & Cai 2003 Bartens et al. 2012 Taha 1997
9	Oct 18	Dan Childers (Sustainability Science and Urban Wetlands)	Urban Sustainability	Seto et al. 2012a Glaeser and Kahn 2010
10	Oct 25	George Hess (Urban/Regional Open Space Design for Wildlife)	Urban planning & design	Reading TBD
11	Nov 1	Morgan Grove (History of socio-ecological research.)	Socio-ecological research. Methods. Data. Challenges in CHN.	Reading TBD
12	Nov 8	David Lewis (Urban Biogeochemistry)	Urban biogeochemistry	Pickett et al. 2008 Kaye et al. 2006 Duren and Miller 2012
13	Nov 15	Alan Yeakley (Management and ecology of urban riparian areas)	Urban hydrology	Ozawa & Yeakley 2007 Groffman et al. 2003 Bartens et al. 2012 Paul and Mayer 2001
14	Nov 22	Nancy Grimm (Urbanization & Global Change)	Urbanization within global environmental change & global perspectives	Adler & Tanner Chapter 5 Seto et al. 2012b Pataki et al. 2011 Grimm et al. 2008
15	Nov 29	Thanksgiving break	No class	-
16	Dec 6 (NCSU Reading Day)	Private Class – invited guest not needed	Student presentations	

References:

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- Collins, S. L., S. R. Carpenter, S. M. Swinton, D. E. Orenstein, D. L. Childers, T. L. Gragson, N. B. Grimm, J. M. Grove, S. L. Harlan, J. P. Kaye, A. K. Knapp, G. P. Kofinas, J. J. Magnuson, W. H. McDowell, J. M. Melack, L. A. Ogden, G. P. Robertson, M. D. Smith, and A. C. Whitmer. (2011). An integrated conceptual framework for long-term social-ecological research. *Frontiers in Ecology and Environment* 9:351-357.
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