

Geography 520 – Physical Geography of the City: Fall 2008

Instructor: Dr. Woonsup Choi

Office hours: W 11:00 – noon and R 4:00 – 5:00 PM or by appointment

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Class meeting time and location: TR 9:30-10:45 in Bolton 281

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E-mail is the best way to reach me during work hours. But do not expect me to respond at night or on weekend. I may do for emergency

Course Objectives

Geography is a discipline that attempts to explain the distribution and spatial patterns found on the surface of the earth. Physical geography focuses on the earth's natural elements. This course focuses on the four main areas of physical geography (climate, water, landform, biogeography) but we focus our attention on the built environment. Cities have traditionally been the focus of social science research. However, cities are dynamic places and, like 'natural' environments, cities possess their own distinct natural and physical systems. This class is recommended for students in geography, ecology, geology, architecture, urban planning, and engineering. Examples of questions we will address in this class include:

1. How does the presence of tall buildings (i.e. downtown) influence the weather experienced?
2. How do cities influence precipitation patterns?
3. The nature of the built environment makes urban areas more prone to which kinds of natural hazards?
4. What kinds of ecosystems and plant communities do we find in cities?

This course is a 3 credit U/G class that meets 2.5 hours each week for lecture. Geography 120 is a prerequisite. Both graduate and undergraduate students may enroll in this course.

Textbooks

Required: **Bridgman, H., Warner, R., and Dodson, J.**, 1995, *Urban Biophysical Environments*, Oxford University Press — Bookstore photocopy.

Suggested: **Goudie, A. and Viles, H.**, 1997, *The Earth Transformed*, Blackwell, ISBN: 0-631-19464-9; **Wackernagel, M. and Rees, W.**, 1996, *Our Ecological Footprint: Reducing Human Impact on Earth*, New Society Publishers, 160 pages, ISBN: 086571312X; **Newman, P. and Jennings, I.**, 2008,

Cities as Sustainable Ecosystems, Island Press, 296 pages, ISBN: 1597261882; **Marten, G.G.**, 2001, *Human Ecology*, Earthscan, 256 pages, ISBN: 1853837148

Course requirements

Attendance:

Test material will come directly from lecture, as well as from slides and other visual presentations provided in class. Students who miss class also miss important announcements or changes to the syllabus. Therefore, it is expected that all students make it a high priority to always attend class. Tardiness is strongly discouraged because it is not only disruptive to the instructor, but to fellow classmates as well. In addition, I do **not** provide copies of my lecture notes or slides **except in case of proven emergency** at my discretion. If you miss class, it is your responsibility to get the missed notes from classmates, as well as any announcements made in class. Each detected non-attendance will result in 2-point penalty and five non-attendances will result in an F grade.

Exams:

There will be three exams. The final is NOT cumulative. The textbook is an excellent resource for test preparation, and it is recommended that students read the textbook to help them prepare for tests. Tests will be based on material presented in class. I also offer a few extra credit questions on tests. If a student misses a test, they may take the make-up exam. However, make-up tests are offered only in case of proven family and medical emergencies, are more difficult than the regular in-class exams, and do not offer extra credit. **THE LAST DAY TO TAKE A MAKE-UP EXAM IS THE 12th of DECEMBER (NOT the day of the final)!**

Class Participation:

I strongly encourage class participation. Student questions about lecture topics are always welcome. In addition, I always make every effort to present ideas and concepts as clearly as possible. However, some topics are more difficult than others, and I encourage students to ask when concepts are not clear.

Paper Reading and Presentation:

Each group of two students must select a paper from the reading list at the end of the syllabus and give a summary presentation according to the class schedule. Other students also should have read the paper by the time of class. The selection of paper must be completed by the 10th of September on a first-come first-served basis. **See the reading list and enroll yourself in the group associated with the article on D2L.** Your classmates will fill out an evaluation form for your presentation. Any group that presents another paper will receive **extra** credit.

Term Paper and Presentation:

A term paper on any aspect of urban physical geography will be due on the 11th of December 2008. The term paper will be a field or data collection project where students collect data and writes up the

project. This includes a literature review, methods section, findings and discussion. Students may pair up (groups no larger than 4) and work together on their project and turn in one paper. Everyone in a group will receive the same grade for the paper. Term paper topics are due by the 2nd of October. You should begin to consult with me way in advance. PAPER LENGTH: 12-15 pgs (not including cover page and references cited). More information will be provided in class. At the end of the semester, students will give a 10-15 minute presentation on their term paper. TERM PAPER FORMAT: 1-inch margins, 12 point Times Roman font, double-spaced, paginated. Although students in the past have enjoyed doing the applied project, I give students the option of working alone and doing a standard library-based term paper. Students must include at least 10 appropriate references, and students doing a library-based paper must use at least 20 appropriate references. Appropriate references are books (not textbooks) and peer-reviewed journals (not popular news and other magazines). NO INTERNET REFERENCES ARE ALLOWED. I will discuss this further in class.

Additional Assistance and Other Information

The instructor is willing to make any reasonable accommodations for students with limitations due to disability, including learning disabilities. If you need special accommodations in order to meet any of the requirements of this course, please contact me as soon as possible. Students will be allowed to complete examinations that are missed because of a religious observance according to the University policy ONLY IF they consulted with me prior to the first exam.

The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. A more detailed description of Student Academic Disciplinary Procedures may be found from <http://www.uwm.edu/Dept/SecU/SyllabusLinks.pdf>. The Geography Department (Bolton 410) has complete information about procedures and regulations regarding this course.

Grades

Test: 210 pts (70 pts each) for UG, 180 pts (60 pts each) for G

Paper presentation: 30pts

Term paper: 100 pts for UG, 130 pts for G

Term paper presentation: 40 pts

Attendance: 20 pts

Total 400 pts

- A = 90-100%, A- = 87-89.99%
- B+ = 83-86.99%, B = 80-82.99%, B- = 77-79.99%
- C+ = 73-76.99%, C = 70-72.99%, C- = 67-69.99%
- D+ = 63-66.99%, D = 60-62.99%
- F = 0-59.99%

After the final exam, the instructor may choose to alter the above grading scheme, but this will only be done to the student's benefit.

To be kept in mind

I may not remain perfectly on track with the syllabus (which is a general outline for what we will cover) and I reserve the right to alter the syllabus. As we proceed through the class, any changes will be announced in class. Students are responsible for being aware of any and all changes to the syllabus, including any announcements made while the student was absent or tardy. Students agree to accept and comply with these requirements by choosing to remain enrolled after learning of these course conditions.

Schedule

Week	Date	Topic	Chapt.	Article
1	2-Sep	Course introduction		
	4-Sep	A/V: The Storm That Drowned a City		
2	9-Sep	Introduction to Urban Physical Geography Climate-Energy and urban heat island	1, 2	
	11-Sep	Climate-Energy and urban heat island Selection of article	2	
3	16-Sep	Climate-Energy and urban heat island	2	Kalnay, E. and Cai, M. Grimmond and Oke
	18-Sep	Climate-Circulation and wind	2	Stone Jr., B.
4	23-Sep	Climate-Cloudiness and precipitation	2	Jauregui and Romales
	25-Sep	Air and water pollution	3, 5	
5	30-Sep	Air and water pollution	3, 5	
	2-Oct	Review for exam Mid-term course evaluation Term paper topic due		
6	7-Oct	Exam 1		
	9-Oct	Hydrology-Hydrological cycle	4	
7	14-Oct	Hydrology-Evapotranspiration	4	Dow and DeWalle
	16-Oct	Hydrology-Soil moisture and groundwater	4	
8	21-Oct	Hydrology-Runoff	4	Rose and Peters
	23-Oct	Hydrology-Landform	4	
9	28-Oct	Hydrology-Water quality	5	Finkenbine, J.K. et al.
	30-Oct	Review for exam		
10	4-Nov	Exam 2		
	6-Nov	Hydrology-Watershed management		Wade, R.J. et al. Booth et al.

11	11-Nov	Ecology-Vegetation	6	Zhang et al.
	13-Nov	Ecology-Vegetation	6	Collings et al.
12	18-Nov	Ecology-Habitat fragmentation		
	20-Nov	Ecology-Ecological footprint		Rees, W.E.
13	25-Nov	Term paper presentation		
	27-Nov	Thanksgiving break		
14	2-Dec	Urban environmental management	8	Savard et al.
	4-Dec	Term paper presentation		
15	9-Dec	Term paper presentation		
	11-Dec	Review for exam Term paper due		
16	17-Dec	Exam 3		

Reading list

** Available at the Library Course Reserve (<https://millib.wisconsin.edu/cgi-bin/Pwebrecon.cgi?DB=local&PAGE=rbSearch>) **

Urban climate

- Grimmond, C.S.B. and Oke, T.R., 1995, Comparison of heat fluxes from summertime observations in the suburbs of four North American cities, *Journal of Applied Meteorology* 34 (PDF).
- Kalnay, E. and Cai, M., 2003, Impact of urbanization and land-use change on climate, *Nature*, vol. 423, 29 May 2003.
- Peterson, T.C., 2003, Assessment of urban versus rural in situ surface temperatures in the contiguous United States: No difference found, *Journal of Climate* 16.
- Stone Jr., B., 2007, Urban and rural temperature trends in proximity to large US cities: 1951-2000, *International Journal of Climatology* 27.
- Jauregui, E. and Romales, E., 1996, Urban effects on convective precipitation in Mexico City, *Atmospheric Environment* 30.

Urban hydrology

- Finkenbine, J.K., Atwater, J.W. and Mavinic, D.S., 2000, Stream health after urbanization, *Journal of the American Water Resources Association* 36(5).
- Wade, R.J., Rhoads, B.L., Rodriguez, J., Daniels, M., Wilson, D., Herricks, E.E., Bombardelli, F., Garcia, M., and Schwartz, J., 2002, Integrating science and technology to support stream naturalization near Chicago, Illinois, *Journal of the American Water Resources Association* 38(4).
- Dow, C.L. and DeWalle, D.R., 2000, Trends in evaporation and Bowen ratio on urbanizing watersheds in eastern United States, *Water Resources Research*, vol. 36, no. 7.
- Rose, S. and Peters, N.E., 2001, Effects of urbanization on streamflow in the Atlanta (Georgia, USA): a comparative hydrological approach, *Hydrological Processes* 15.
- Booth DB, Hartley D, Jackson R, 2002, Forest cover, impervious-surface area, and the mitigation of stormwater impacts, *JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION* 38(3).

Urban ecology

Collings, J.P., Kinzig, A., Grimm, N.B., Fagan, W.F., Hope, D., Wu, J., Borer, E.T., 2000, A new urban ecology, *American Scientist* 88 (PDF).

Savard J.P.L., Clergeau P., and Mennechez G., Biodiversity concepts and urban ecosystems, *LANDSCAPE AND URBAN PLANNING* 48 (PDF).

Rees W.E., 1999, The built environment and the ecosphere: a global perspective, *BUILDING RESEARCH AND INFORMATION* 27

Zhang XY, Friedl MA, Schaaf CB, Strahler AH, Schneider A, 2004, The footprint of urban climates on vegetation phenology, *GEOPHYSICAL RESEARCH LETTERS* 31(12): L12209.