2014

Syllabus: Sustainable Green Infrastructure Planning and Design

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Overview

Green infrastructure planning requires a systems approach to improving ecological function while providing vital ecosystem services for human populations. This course will introduce students to the concepts, theories, and applications of greenway and green infrastructure planning at multiple scales, including the site-level, neighborhood, and regional scales. A particular area of focus will be the relationship of green infrastructure for improving hydrology and riparian corridors as part of comprehensive green space planning for recreation and cultural resources. The course will look at a wide range of systems including water, transportation, and food systems. A case study approach will be used to study green infrastructure projects both domestically and internationally from a planning and policy perspective, as well as implementation.

Goals

1. To help students understand how the concept of green infrastructure developed and put it relationship to the larger historical framework of environmental planning and sustainable development.

2. To give students the introductory tools to conceptually plan a green infrastructure system; evaluate policies; and develop implementation strategies.

3. To help students recognize that the human component of sustainable, multifunctional landscapes is critical both for human health and for long term ecological preservation.

4. To show students how to incorporate multiple spatial scales thinking for understanding ecological systems and when applying them to design and planning problems.

5. To give students a beginning understanding of the economic impacts and benefits of multi-functional green infrastructure planning.
Class format: The class will include lectures and discussions about our course readings. In addition, we plan on having a few local fieldtrips to visit some examples of green infrastructure projects. The case-study approach to green-infrastructure means will involve reading about green infrastructure theory/concepts than looking at examples of built green infrastructure projects.

Readings

Text Books


These required texts are available at the Amherst Books, 8 Main St.
* Sarté is also available as an e-book from the University Library.

Course Reader: Other course readings are available on electronic reserve at the University Library web-page: http://ereserves.library.umass.edu/. You will need a password to access these reserves. The password will be given out at the first class meeting.

Schedule

Week 1: Overview/Greenway definitions

Jan. 22 – Overview, goals and objectives, definitions of green infrastructure

Jan. 24 – Brief history of green infrastructure
**Week 2: Building the Case for Green Infrastructure: State of the Planet**

Jan. 29- History of the development of green infrastructure continued, emphasis on the environmental and green movements.
- Readings about the Clean Water Act and Clean Air Act (links to be provided).

Jan. 31- Introduction to landscape ecology and resilience

**Week 3**

Feb. 5- Landscape ecology (continued)

Feb. 7-- Solid waste management: Potential fieldtrip to composting facilities/ Umass/ Amherst (T.B.A.)

**Week 4: Hydrology**

Feb. 12- significance of spatial scale and multi-functionality, introduction to hydrology as a system that is influenced by human development at multiple scales
Feb. 14- hydrology continued, emphasis on green infrastructure solutions to wastewater problems

- Example of watershed management in Massachusetts: Ipswich River Restoration -
  http://www.mass.gov/dcr/watersupply/ipswichriver/index.htm

**Week 5: Urban agriculture**

Feb. 19- No class: Monday schedule followed for Presidents' Day

Feb. 21- Current issues with food networks and green infrastructure solutions
  (Guest lecturer: Sustainable agriculture)


**Week 6: Transportation and Energy**

Feb. 26- Transportation


Feb. 28- Energy


**Week 7: Climate**

March 5- Climate mitigation at the local and regional level


March 7 - Micro-climate regulation (Department studio presentations)

Week 8: Human health and well-being

March 12 – Health, wellness and restorative landscapes
• Tzoulas, Konstantinos, Korpela, Kalevi, Venn, Stephen, Ylipekonen, Vesa, Kazmierczak, Aleksandra, Niemela, Jari, and James, Philip. 2007. Promoting ecosystem and human health in urban areas using green infrastructure: a literature review. Landscape and Urban Planning 81, 167-178.

March 14 – Recreational landscapes

Mid-term Examination (tentative date)

Spring Break: March 17-24

Week 9 Cultural Landscapes and Green Infrastructure

March 26 – Cultural landscapes

March 28 – Perception of sustainable landscapes and building public acceptance

• Additional readings (2) to be handed-out.

**Week 10 Greenways**

April 2 – Introduction to greenways


April 4 – Multi-functionality of greenways

• Greenway case studies (optional field-trip day).

**Week 11 International greenway: Planning and design**

April 9 – Planning and designing greenways


April 11 – Greenways: an integral part of sustainable community development


**April 12-13, 2013: Fabos Conference on Landscape and Greenway Planning: Pathways to Sustainability, UMass Campus Center** (Attend 3 sessions min.)
http://blogs.umass.edu/faboslgpconf/

**Week 12 Economic Aspects of Green Infrastructure**

April 16- Economy and green infrastructure

April 18 – Economy and green infrastructure continued

**Week 13  Land Use Planning and Policy related to Green Infrastructure**

April 23- Land use and zoning- current limitations in most urban areas
• Green Infrastructure Tool-kit: Arc of Innovation (link to be provided)

April 25 – Land use and zoning regulations that support green infrastructure

**Week 14**

April 30 – Class synthesis: Greenways and green infrastructure
Final Project due

**Requirements**

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<tr>
<th>Assignments</th>
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<tbody>
<tr>
<td>Mid-term examination</td>
<td>30%</td>
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<tr>
<td>Final project</td>
<td>30%</td>
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<tr>
<td>Active reading notes</td>
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<tr>
<td>Class participation</td>
<td>10%</td>
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<td><strong>Total</strong></td>
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**Problem-solving assignments:** We will have two brief assignments involving gathering case-studies of green infrastructure as part of our field trips/ web-based research. More details will be handed out in class.

**Mid-term examination:** The first half of the course focuses on general subject areas related to green infrastructure. The mid-term exam will be a mix of open ended, problem-solving questions, along with close-ended questions about the facts of...
these subject areas. Your critical thinking questions will be extremely useful in studying for this exam.

Final project: Since this course is focused on helping students address “real-world” environmental problems while accommodating human needs, it will have a final project that allows students to synthesize the skills and knowledge they have learned in the class to an actual site/situation. Students will be able to choose their own site and general topic related to the course; and write a report discussing how they would address this environmental problem using a multi-functional green infrastructure solution. Further details on this final project will be handed out later in class.

Active reading and critical thinking: In order to insure that students are prepared for class discussion, they will be expected to come prepared with a list of 3-5 summary points from each assigned reading. As critical thinkers, this could include questions that were raised by the authors; disagreements you may have with what the author said; or connections from this reading to others in our class. At the beginning of the class, you will turn these summary points in written form; we will transition to an electronic-format for sharing with the entire class later in the semester.

Class participation: Students are expected to attend class on a regular basis. Unexcused absenteeism will result in a lower grade. Our course readings will form the basis for lectures and discussions. Therefore, students are expected to have completed the readings prior to class time and be active participants in class discussions. In addition, students are expected to attend the Fabos Conference on Landscape and Greenway Planning and summarize 1-2 talks for our next class.

Grading Allocation from total points possible in the course. Criteria include completeness of work, grammar, punctuation, critical thinking, organization, and application of course readings and lectures.

A = 92.5-100%
A- = 90.0-92.5%
B+ = 87.5-89.9%
B = 82.5-87.5%
B- = 80.00- 82.5%
C+ = 77.5%- 79.9%
C = 72.5- 77.5%
C- = 70.00- 72.5%
D+ = 67.5%- 69.9%
D = 62.5- 67.5%
D- = 60.00- 62.5%
F= under 50%

Unless prior accommodation has been made, according to University policy listed below, late assignments will receive a lower grade of 2.0% for each class
period that they are late. In addition, students will receive an incomplete and/or failing grade in the course if they have not completed all assignments and submitted hard-copy assignments to the instructor by the beginning of finals.

**Accommodation Policy Statement**

The University of Massachusetts Amherst is committed to providing an equal educational opportunity for all students. If you have a documented physical, psychological, or learning disability on file with Disability Services (DS), Learning Disabilities Support Services (LDSS), or Psychological Disabilities Services (PDS), you may be eligible for reasonable academic accommodations to help you succeed in this course. If you have a documented disability that requires an accommodation, please notify me within the first two weeks of the semester so that we may make appropriate arrangements.

**Graduate School Interim Statement on Academic Honesty**

It is expected that all graduate students will abide by the Graduate Student Honor Code and the Academic Honesty Policy (available at the Graduate Dean's Office, the Academic Honesty Office (Ombud's Office) or online at http://www.umass.edu/gradschool/handbook/univ_policies_regulations_a.htm). Sanctions for acts of dishonesty range from receiving a grade of F on the paper/exam/assignment or in the course, loss of funding, being placed on probation or suspension for a period of time, or being dismissed from the University. All students have the right of appeal through the Academic Honesty Board.