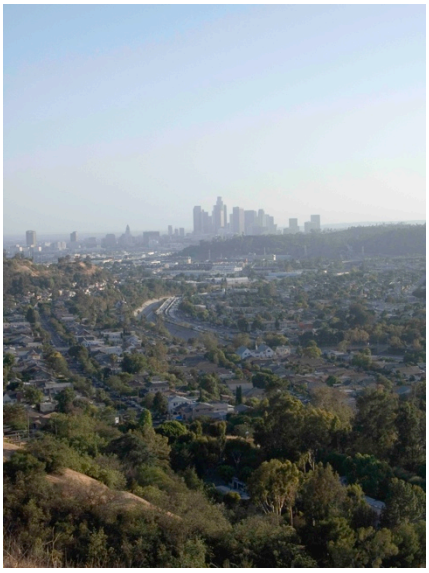
**USC**School of Architecture

# Arch 361L
# Ecological Factors in Design



**Spring 2016 —Tuesday 4:00–6:50 P.M.**

**Location:** B57A Allan Hancock Foundation

**Instructor:** Travis Longcore, Ph.D.

**Office:** B55 Allan Hancock Foundation

**Office Hours:** Wednesday, 2–6 P.M., Third Floor Watt Hall

**Website:** blackboard.usc.edu

**Contact Info:** longcore@usc.edu, (310) 247-9719 (mobile), travislongcore (Skype)

## Course Description

*Lectures, laboratory exercises and field trips introduce basic knowledge of incorporating ecological factors in urban design and interaction of landscape science with the human environment.*

The majority of humans now live in cities and that proportion is growing. As a result, the experience of the world and its ecological systems has changed significantly for most people, and the influence of human settlements on the natural environment has increased dramatically. Both of these consequences — the changed human experience of the world and our influence on it — depend on the design of cities at every scale. Design choices that are made at regional, municipal, local, and site scales affect the everyday experience for all species. The purpose of this course is to explore the ways in which the natural world interacts with cities, regions, and sites, and in turn how designs at these scales can incorporate the natural world into the urban environment in a way that maximizes environmental protection and enhances the human experience.

The course will concentrate on both the history and theory of urban ecological design and on the computing tools currently available to undertake quantitative (and usually spatial) analysis of the effects of alternative urban designs. In this sense, the course is situated both within landscape ecology and urban ecology and also in the applied disciplines of planning and architecture, and therefore is part of the newly identified domain of "geodesign."

Students in this course will undertake exercises to develop understanding of the course content, explore new tools inspired by curiosity, develop writing skills, and share the results with the world. That is, at least in part, students will be doing work that will be posted immediately to the Internet, in the form of writing, re-writing, and editing well-referenced and well-researched entries on the free encyclopedia

Wikipedia. For a topic of such importance and full of innovation, an undergraduate learning experience can also contribute to the public good!

### *Learning Objectives*

By the end of this course, students should be able to:

- Explain basic landscape ecology concepts linking natural and human systems;
- Articulate key terms and basic concepts of environmental performance in human-dominated landscapes;
- Access sources of primary scientific literature on environmental effects of urban design;
- Use environmental performance concepts to critically review and propose landscape designs in cities;
- Evaluate the available software tools and conceptual models available to provide feedback on alternative proposed urban designs;
- Communicate clearly to a general audience on a technical topic;
- Evaluate the quality and appropriateness of difference sources of technical information; and
- Work smoothly in a collaborative environment.

### *Recommended Preparation*

All students with an interest in the topic are welcome in the class. It has no prerequisites. Students will need to have a willingness to learn new software and to do introductory html coding. A background in Geographic Information Systems (GIS) would be helpful but is not required.

## Required Readings

Marsh, William M. 2010. Landscape Planning: Environmental Applications, 5th Edition. John Wiley & Sons, New York. A digital version can be rented for 180 days for $47.50 through this link. Print copies are available used for about $30.

## Description of Assignments

The course will require accessing and studying course materials before the class meeting time, then taking short quizzes and discussion of material during class. We will have two written assignments involving writing for the online encyclopedia Wikipedia. Each student will be responsible for exploring and developing an in-class demonstration of a software tool associated with incorporating ecological factors into design.

### *Weekly Reading Assessments and Discussion*

Research on retention of reading material indicates that new information enters long-term memory fastest and most efficiently when the material is tested quickly and often. We will therefore have short quizzes on the reading material each week at the start of class, followed by discussions about the assigned materials.

### *Individual Writing Assignment*

With the advent of the Internet, coursework no longer has to be useful only to the person learning the material. Rather it can become part of educating a wider audience about topics of broad interest. Therefore, the writing assignments will involve learning how to construct Wikipedia articles that meet the standards of verifiability and neutral point of view. The individual Wikipedia writing assignment is to write an article on a topic covered in the class that is not already adequately covered in Wikipedia.

### *Individual Tool Demonstration Assignment*

Many tools, most of which are to some degree digital, are available to help designers and planners better integrate ecological information. For logistical reasons, we will concentrate on those tools that are low-cost or open source. Each student will be responsible for picking one of the many tools available, learning its capabilities, and leading an in-class demonstration of the tool in which other students gain hands-on experience with the tool.

### *Final Project — Group Writing Assignment*

The final project will be a group effort and will combine skills writing for Wikipedia with the individual tool demonstrations. The class will develop an online directory in Wikipedia for tools that are used to integrate ecological factors in design. This tool report will probably be incorporated in or linked from the Wikipedia article for "geodesign."

## Course Schedule

| | Topics/Readings | Deliverables |
|---|---|---|
| **Week 1** | **Landscape and Environmental Planning: Roots and Shoots**<br>Marsh, Chapter 0, 1 | Start Wikipedia student orientation<br>Sign up on course page |
| **Week 2** | **Landscape Form, Slope and Aspect**<br>Marsh, Chapter 3, 4 | Quiz<br>Complete Wikipedia orientation |
| **Week 3** | **Soils and Wastewater Disposal**<br>Marsh, Chapter 5, 6 | Quiz<br>Leave Wikipedia comment on a page relevant to course<br>List possible article topics on your user page |
| **Week 4** | **Groundwater and**<br>Marsh, Chapter 7 | Quiz<br>**Geotracker GAMA demo**<br>Add new info to a course-related Wikipedia page |
| **Week 5** | **Stormwater**<br>Marsh, Chapter 8 | Quiz<br>**i-Tree Hydro demo**<br>Select project topic<br>Post bibliography on talk page |
| **Week 6** | **Watersheds**<br>Marsh Chapter 9<br>Watch Kongjian Yu lecture, | Quiz<br>**EPA Stormwater Calculator demo**<br>3-4 paragraph summary of article in sandbox |
| **Week 7** | **Streamflow, and Floods**<br>Marsh, Chapter 10, | Quiz<br>**HEC-EFM demo**<br>Publish and expand article |
| **Week 8** | **Water Quality**<br>Marsh, Chapter 11, | Quiz<br>**i-Tree Canopy demo**<br>Expand article and select peer edit articles |
| **Week 9** | **Soil Erosion/BMPs**<br>12, 13 | Quiz<br>**NatureServe Vista Demo**<br>Leave comments on talk page for peer edit articles<br>Copy-edit peer edit articles |
| **Week 10** | **Riparian Landscapes**<br>14 | Quiz<br>**Circuitscape Demo**<br>Make article revisions based on feedback |

| | | |
|---|---|---|
| **Week 11** | **Coastal Zone Management**<br>Chapter 15 | Finalize individual article |
| **Week 12** | **Sun, Shade, and Microclimates**<br>Chapter 16, 17 | |
| **Week 13** | **Vegetation and Land Use**<br>Marsh, Chapter 19 | List software covered in final project |
| **Week 14** | **Landscape Ecology**<br>Marsh, Chapter 20 | Draft of software review |
| **Week 15** | **Biomimicry**<br>Watch Janine Beynus lecture | Finalize Group Project |

## Grading

Grades will be assigned according to performance on the assessments as follows:

Weekly quizzes (15%)
Wikipedia article
    Weekly benchmarks (15%)
    Final article (25%)
Software demonstration (15%)
Final Project
    Peer evaluations (10%)
    Final product (20%)

### *Letter grading*

| | |
|---|---|
| A | 93.0–100 % |
| A– | 90.0–92.9 % |
| B+ | 87.0–89.9 % |
| B | 83.0–86.9 % |
| B– | 80.0–82.9 % |
| C+ | 77.0–79.9 % |
| C | 73.0–76.9 % |
| C– | 70.0–72.9 % |
| D+ | 67.0–69.9 % |
| D | 60.0–66.9 % |
| F | <600 % |

### *Pass/Fail grading*

| | |
|---|---|
| Pass: | ≥73.0 % |
| Fail: | <73.0 % |

## Assignment Submission Policy

All assignments will be submitted digitally and will be due according to the instructions provided for submission. Late work will be subject to a 10-point penalty per day.

## Attendance Policy

The School of Architecture's general attendance policy is to allow a student to miss the equivalent of one week of class sessions (three classes if the course meets three times/week, etc.) without directly affecting

the student's grade and ability to complete the course. If additional absences are required for a personal illness/family emergency, pre- approved academic reason/religious observance, the situation should be discussed and evaluated with the faculty member and appropriate Chair on a case-by-case basis. For each absence over that allowed number, the student's letter grade will be lowered 1/3 of a letter grade (e.g., A to A–).

Any student not in class within the first 10 minutes is considered tardy, and any student absent (in any form including sleep, technological distraction, or by leaving mid class for a long break) for more than 1/3 of the class time can be considered fully absent. If arriving late, a student must be respectful of a class in session and do everything possible to minimize the disruption caused by a late arrival. It is always the student's responsibility to seek means (if possible) to make up work missed due to absences, not the instructor's, although such recourse is not always an option due to the nature of the material covered.

Being absent on the day a project, quiz, paper or exam is due can lead to an "F" for that project, quiz, paper or exam or portfolio (unless the faculty concedes the reason is due to an excusable absence for personal illness/family emergency/religious observance). A mid term or final review is to be treated the same as a final exam as outlined and expected by the University.

## Statement for Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. Website and contact information for DSP: http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html, (213) 740-0776 (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX) ability@usc.edu.

## Statement on Academic Integrity

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *SCampus*, the Student Guidebook, (www.usc.edu/scampus or http://scampus.usc.edu) contains the University Student Conduct Code (see University Governance, Section 11.00), while the recommended sanctions are located in Appendix A.

## Emergency Preparedness/Course Continuity in a Crisis

In case of a declared emergency if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies.