USCSchool of Architecture

Arch 531 The Natural Landscape

Fall 2016 —Thursdays — 5:00–7:50 P.M.
Location: ZHS 163

Instructor: Travis Longcore, Ph.D.

Office: Watt Hall 331
Office Hours: Monday, 12:30–2:00 P.M.
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Course Description

The course of study in Landscape Architecture is rightly focused on design. Students explore how, through design interventions, places can be made that "work," often from an experiential, aesthetic, or social perspective. As landscape architects become leaders in sustainability and in the field of ecological restoration, there is recognition that designed places must also work as a component of the natural landscape and projects are called upon to perform ecosystem functions. The purpose of this course is to provide the necessary scientific background on the patterns, processes, and performance of the natural landscape — defined as the surface of the Earth with minimal human intervention — to inform design options ranging from plant choice to patch size to corridor configuration.

The course has two modules: landscape ecology and world vegetation.

The first half of the course will build an understanding of the patterns of vegetation found across the surface of the Earth and the biophysical processes that determine that distribution. This investigation starts with the broadest elements of the Earth's climate and how these physical factors interact with plants to create the characteristic landscapes found in different regions around the world. Special attention will be paid to the types of plants found in each of these landscapes, both to understand their function, but also to inform future plant choices in landscape design. Each of the major biomes of the world will be reviewed.

The second half of the course will introduce the topic of landscape ecology, building an understanding of how the patterns on the natural landscape influence species distribution and ecosystem function. An appreciation of the function of patches in the landscape will emerge from the foundational Theory of Island Biogeography. Potential design elements, such as edges, patches, corridors, and networks, will be explored in terms of the natural landscape and their performance to support ecosystem function and species diversity.

Learning Objectives

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

- Identify characteristics of plants that allow for survival in extremes of heat, drought, saturation, salts, and other environmental conditions.
- Locate and name the areas of the Earth that contain representations of a particular set of climatic, soil, and disturbance conditions.
- Describe the role of disturbance in structuring vegetation communities across different climatic conditions.
- Recall the basic patterns of global climate relevant to plant distribution.
- Identify the conditions that promote high plant diversity and locate those regions that have high and low plant diversity.
- Explore the potential results of global climate change on vegetation.

- Explain the foundations of the Theory of Island Biogeography and its influence on understanding species diversity.
- Describe the attributes of landscape patches and edges that influence species diversity and distribution.
- Have a basic understanding of population dynamics, extinction, and metapopulations with respect to landscape pattern.
- Understand the role of corridors in species dispersal and describe the attributes that contribute to corridor performance.
- Be able to identify and describe stream and river form and dynamics related to rainfall and topography.

Recommended Preparation

Undergraduate life sciences general education.

Required Readings

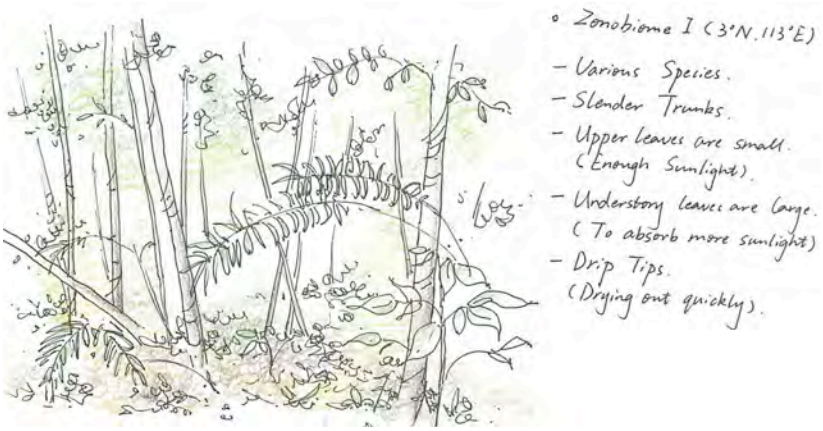
Breckle, S.-W. 2004. *Walter's Vegetation of the Earth*. Fourth Edition. Springer, Berlin.

Forman, R.T.T. 1995. *Land Mosaics: The Ecology of Landscapes and Regions*. Cambridge University Press.

These two texts can serve as references for years to come, so despite their cost, both are required. Lower-cost used and electronic editions are available.

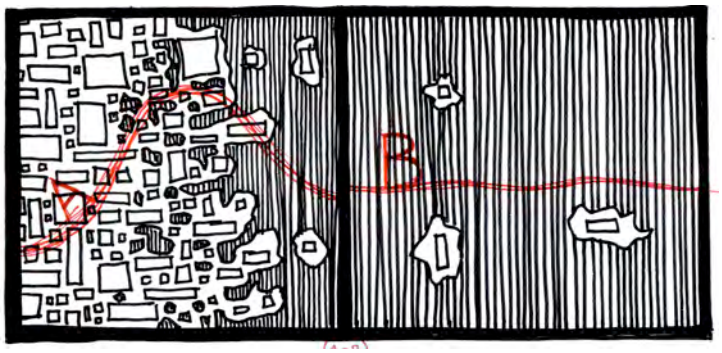
Description and Assessment of Assignments

The class exercises will be assigned at regular intervals throughout the semester. These assignments involve interpretation and application of the material presented in lecture and the texts.



Exercises will be assessed on the basis of creativity, design, and scholarly content. Some exercises require freehand illustration and creative design based on course materials. The ideas conveyed by these designs, as well as the incorporation of course material, will contribute to grades. Quality of drawing is not an element contributing to the grade, given the broadly different backgrounds, but non-design students must make a careful and thorough effort.

We will use the exercises to explore the resources available to understand the distribution and diversity of the species found in different climate zones around the world. We will explore the campus to see and document species in person, using the iNaturalist application, which is a volunteer science platform where observations can be identified and curated by other users working collaboratively. We will use other volunteer science programs to obtain imagery of locations around the world, expanding our visual "library" of plant forms and landscapes.



Grading Breakdown

Grades will be assigned according to performance in five exercises (40%), five quizzes (40%), and a final exam (20%).

Letter grading

A+	97.0–100 %
A	93.0–96.9 %
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

Assignments are to be submitted at the start of class on the day the assignment is due.

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.

See full attendance statement at: http://arch.usc.edu/People/SchoolGovernanceDocuments

Course Schedule

	Topics/Daily Activities	Readings	Deliverables
Week 1 8/25	Introduction, Genetics, Species Diversity	None	
Week 2 9/1	Patches, Edges and Boundaries	*Land Mosaics*: Chapters 1 and 2	
Week 3 9/8	Edges and Boundaries Corridors	*Land Mosaics*: Chapter 3 *Land Mosaics*: Chapters 5 and 6	Quiz 1
Week 4 9/15	Streams, rivers, and flows	*Land Mosaics*: Chapters 7 and 10	
Week 5 9/22	Disturbance/Population Dynamics	*Land Mosaics*: Chapter 10–11	*Exercise 1 Due*
Week 6 9/29	Climate Diagrams, Physical Factors	*Walter's Vegetation of the Earth*, pp. 10–42	Quiz 2
Week 7 10/6	Water Relations, Salts	*Walter's Vegetation of the Earth*, pp. 42–74	
Week 8 10/13	Ecological Systems	*Walter's Vegetation of the Earth*, pp. 76–110	*Exercise 2 Due*
Week 9 10/20	Tropical Rainforest	*Walter's Vegetation of the Earth*, pp. 115–161	Quiz 3
Week 10 10/27	Savannas, Tropical Deciduous Forest	*Walter's Vegetation of the Earth*, pp. 163–210	*Exercise 3 Due*
Week 11 11/3	Hot Deserts, Sclerophyllic Woodlands	*Walter's Vegetation of the Earth*, pp. 211–281	Quiz 4
Week 12 11/10	Sclerophyllic Woodland, Laurel Forest	*Walter's Vegetation of the Earth*, pp. 281–307	*Exercise 4 Due*
Week 13 11/17	Deciduous Forest	*Walter's Vegetation of the Earth*, pp. 309–369	Quiz 5
Week 14 11/24	Thanksgiving		
Week 15 12/1	Steppes and Cold Desert, Taiga, Tundra	*Walter's Vegetation of the Earth*, pp. 371–461	*Exercise 5 Due*
Finals Week	Final Exam		

Supplemental Readings

The following readings are provided for students to explore the topics presented beyond the required readings and lectures. These readings will be useful as background for the exercises and for further detail about particular topics. Only those noted in the Course Schedule are required and those will be posted on the course website for easy access.

Dallman, P. R. 1998. *Plant life in the world's Mediterranean climates*. California Native Plant Society, Los Angeles. pp. 1–89.

Marzluff, J. M. 2005. Island biogeography for an urbanizing world: how extinction and colonization may determine biological diversity in human-dominated landscapes. *Urban Ecosystems* 8(2):1573–1642.

Walter, H. S. 2004. The mismeasure of islands: implications for biogeographical theory and the conservation of nature. *Journal of Biogeography* 31:177–197.

Keeley, J.E. 2006. South Coast Bioregion. Pp. 350–390 in Sugihara, N. G., J. W. Van Wagtedonk, K. E. Shaffer, J. Fites-Kaufman, and A E. Thode. *Fire in California's Ecosystems*. University of California Press, Berkeley.

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards http://studentaffairs.usc.edu/scampus/. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, http://www.usc.edu/schools/GraduateSchool/academic_conduct.html.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity http://equity.usc.edu/ or to the Department of Public Safety http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men http://www.usc.edu/student-affairs/cwm/ provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute http://dornsife.usc.edu/ali, which sponsors courses and workshops specifically for international graduate students.

The Office of Disability Services and Programs http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations.

If an officially declared emergency makes travel to campus infeasible, USC Emergency Information http://emergency.usc.edu/will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.