ARCH 531 – The Natural Landscape

Spring 2012 – Thursdays, 3:30–6:30 P.M.

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Introduction and Purposes

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.

By the end of this course, students will:

- 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 resepct to landscape pattern.
- Understand the role of corridors in species dispersal and the 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.

Course Outline

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

Part I – 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.

Part II – Landscape Ecology

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.

Course Requirements and Grades

Texts

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 editions are available.

Grading

Grades will be assigned according to performance in class exercises (50%) and five quizzes (50%).

The class exercises will be assigned on a rotating basis such that not every student has an exercise due at the same time. Each student might have an assignment every second or third week depending on the number of students enrolled. These assignments will involve design interpretation of the material presented in lecture and the text. Students must also be in class to discuss these exercises, so participation will be a component of the grade for the exercises.

The quizzes are spaced throughout the semester and will cover material from lecture and readings.

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 %

Course Readings/Class Sessions

Topic	Readings
January 12 – Introduction, Climate Diagrams, Physical Factors	*Walter's Vegetation of the Earth*, pp. 10–42
January 19 – Water Relations, Salts	*Walter's Vegetation of the Earth*, pp. 42–74
January 26 – Ecological Systems/Quiz	*Walter's Vegetation of the Earth*, pp. 76–110
February 2 – Tropical Rainforest	*Walter's Vegetation of the Earth*, pp. 115–161
February 9 – Savannas, Tropical Deciduous Forest	*Walter's Vegetation of the Earth*, pp. 163–210
February 16 – Hot Deserts, Sclerophyllic Woodlands/Quiz	*Walter's Vegetation of the Earth*, pp. 211–281
February 23 – Sclerophyllic Woodland, Laurel Forest	*Walter's Vegetation of the Earth*, pp. 281–307
March 1 – Deciduous Forest	*Walter's Vegetation of the Earth*, pp. 309–369
March 8 – Steppes and Cold Desert, Taiga, Tundra/Quiz	*Walter's Vegetation of the Earth*, pp. 371–461
Spring Break	
March 22 – Patches	*Land Mosaics: Chapters 1 and 2*
March 29 – Edges and Boundaries	*Land Mosaics: Chapter 3*
April 5 – Corridors/Quiz	*Land Mosaics: Chapters 5 and 6*
April 12 – Streams, rivers, and water	*Land Mosaics: Chapters 7 and 10*
April 19 – Disturbance ecology	*Land Mosaics: Chapter 10*
April 26 – Population dynamics/Quiz	*Land Mosaics: Chapter 11*

Bibliography

Additional Background Readings

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.

Ricketts, T. H. 2001. The matrix matters: effective isolation in fragmented landscapes. *American Naturalist* 158:87–99.

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

Minnich, R. 1983. Fire mosaics in southern California and northern Baja California. *Science* 219:1287–1294.

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.

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. The phone number for DSP is (213) 740-0776.

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, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/. The USC summary of how to avoid plagiarism: http://www.usc.edu/student-affairs/student-conduct/ug_plag.htm and specific advice for grad students: http://www.usc.edu/student-affairs/student-conduct/grad_ai.htm may also be useful.

Accreditation

The Master of Landscape Architecture degree program includes three curricula. Curriculum +3 for students with no prior design education and Curriculum +2 for students admitted with advanced standing have full accreditation by the Landscape Architecture Accreditation Board. Curriculum +1.5 for students with advanced placement is a post-professional study and is not subject to accreditation. Information about landscape architecture education and accreditation in the United States may be found on-line at http://www.asla.org/Education.aspx.