USC

School of Architecture

Master of Landscape Architecture Program

Arch 537 - Urban Plant Ecology: Environmental Perspectives

Units: 3
Spring 2019
Day and Time
Thursdays 12:00 noon to 2:50pm

Location: Harris 102

Instructor: Dr. Denise Buchanan
Office Hours Meeting Location: TBD
Office Hours: 10am - 12noon Thursdays (by appointment)

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Background:
We are increasingly challenged to pursue and achieve higher levels of sustainability and benefit in all areas of our urban environment, including the landscapes. Many conventional landscape practices rely upon the heavy use of energy, water and other resources to build and maintain them. As a result, urban landscapes typically lead to a net depletion of environmental resources as well as add to greenhouse gas production and other forms of urban pollution and stress on the environment.
Information found in the study of plant physiology and morphology, and the principles and concepts of plant ecology can provide a framework that can help achieve urban landscapes with increased levels of sustainability and benefit. This framework can be refined through the focused study of California native plant communities and species as a model that can be incorporated into global urban landscapes with increased levels of sustainability.
Such information and effort is fully consistent with the USC 2010 Imperative Statement supporting ecological literacy among faculty and students: “The design should engage the environment in a way that dramatically reduces or eliminates the need for fossil fuel.”

Course Description:

The primary purpose of this course is to develop a foundation of principles and concepts of plant ecology that provide greater benefits and achieve higher levels of sustainability for urban planting design. Using the introduction of California native plant species and communities as a template, students will explore the inhibiting factors and opportunities to develop sustainable landscapes in urban environments.

ARCH 537 involves:

(1) the review of information found in plant physiology, and ecological principles and concepts of sustainability found in natural systems, foundation principles

(2) the study of native and introduced plant species and plant associations of Southern California and their relationships to the wider global community

(3) analyzing the factors influencing the sustainability of urban ecosystems

(4) calculations and data used to estimate water and energy use associated with urban landscapes in order to determine levels of landscape efficiency.

Learning will be achieved through lectures, discussions, campus planting identification walks and field trips. Lectures will incorporate a series of weekly exercises and readings.

Learning Goals:

a. To demonstrate a working knowledge of the principal native plant communities, species and cultivars of California, including: coastal sage scrub, chaparral, riparian, oak & walnut woodland, and low desert.

b. To build a foundation of plant identification skill and knowledge through plant study walks, lectures and local field trip activities.

c. To describe ways the principles and concepts of plant ecology, plant physiology and plant morphology can be applied to urban landscapes for increased levels of sustainability.

d. To establish a framework for the ongoing study of plants for use in urban landscapes with awareness of climate, habitat, water and energy factors. e. To describe an energy-based approach for measuring landscape sustainability and the carbon footprint of urban landscapes modeled after natural landscape systems.

e. To achieve an introductory knowledge for preparing landscape plant palettes, water and energy budgets, and addressing fire safety and invasive plant issues.

Expected Results:

Upon completion of this course each student should be able to:

a. Identify and describe the key native plant communities and environmental conditions of southern California.

b. Be capable of identifying 25-30 of the principal California native plant species associated with the sage scrub, chaparral, oak & walnut woodland, and riparian plant communities of Southern California, and their significant environmental adaptations and morphological characteristics.

c. Explain sustainable urban planting concepts based on the understanding of ecological principles, and the plant communities and species studied.
d. Describe sustainable landscape practices, prepare landscape water budget calculations, and prepare energy/carbon budgets for urban landscapes.

Course Methodology

A number of learning techniques are planned for this course, including:
a. Lectures and discussions on topics of principles of ecology, plant physiology, plant communities, and sustainability.
b. Weekly lectures along with field trips are planned for identification of plant species and communities, and to explore environments and gardens of Southern California.
c. Assigned reading and research, quizzes and preparation of written profiles on plant species and communities, and special topic written papers.
d. Plant palette, water budget and carbon/energy budget sketch exercises.

Attendance and Grading

Attendance is required for all lectures, campus plant identification walks and off campus field trips. Absence from field trips requires independent field trip completion within one week of the initial field trip date.
More than one absence can result in the lowering of the course grade by 1/3 for each additional absence up to a maximum lowering of 1 letter grade in the course. Classroom activities missed during an absence must be completed prior to the next class. All late work must be submitted no later than one week following the posted deadline and can receive a maximum 90% value.
See full attendance statement at: http://arch.usc.edu/People/SchoolGovernanceDocuments

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. Being absent on the day a project, quiz, paper or exam is due can lead to an “F” for that project, quiz or paper (unless the faculty concedes the reason is due to an excusable absence for personal illness/family emergency/religious observance).

It is required that proper professional etiquette be displayed by attending the presentations of each of your classmates. Professional conduct requires that you manage your time in such a way that is not disrespectful to others. Participation in class discussions is required and your participation will constitute part of your grade.

The basis for the course grade is divided among the following activities.

Lecture Exercises/Assignments	40%
Plant Profile Sheets & ID Exams	20%
Midterm & Final Exam	25%
Final Course Exercise	15%
	100%

Points are assigned for all plant ID profiles, exercises, assignments, papers, quizzes and exams. Grades for each assignment, project and exams for the course is based upon the following scale:

PERCENTAGE BREAKDOWN

94-100% = A	73-75% = C
90-93% = A-	70-72% = C-
86-89% = B+	66-69% = D+
83-85% = B	63-65% = D
80-82% = B-	60-62% = D
76-79% = C+	

Technological Proficiency and Hardware/Software Required:
Students will utilize MS Word, Excel, Adobe Photoshop, hand drawing and GIS software to research and develop planting design concepts.

Required Text:
Bornstein, Carol; Fross, David, and O'Brien, Bart, (2005) California Native Plants for the Garden, Cachuma Press.

Reference Material:

1) http://arnoldia.arboretum.harvard.edu/
2) ASLA Sustainable Sites Initiative: http://www.sustainablesites.org/ 3) Bay Friendly Landscape Guidelines: http://www.portofoakland.com/pdf/environment/BFLGComplete.pdf
4) Sunset Western Landscaping: latest edition
5) Oudolf, Piet. (2000) Designing with Plants, Timber Press Inc.,
6) Oudolf, Piet and Kingsbury, Noel. (2013), Planting: A New Perspective, Timber Press Inc.
7) Rubin, Greg and Warren, Lucy. (2016) The Drought-Defying California Garden: 230 Native Plants for a Lush, Timber Press Inc
8) Keator, Glenn and Middlebrook, Alrie. (2007) Designing California Native Gardens: The Plant Community Approach to Artful, Ecological Gardens, UC Press
9) Perry, Bob, Landscape Plants for California Gardens, Land Design Publishing
10) Thompson, William J., and Sorvig, Kim, Sustainable Landscape Construction, Island Press. Second Edition.
11) Bakker, Elna. (1984) An Island called California: An Ecological Introduction to Its Natural Communities. University of California Press, Second Edition, Revised and Expanded.

12) Barbour, Michael G. and Major, Jack, Terrestrial Vegetation of California, John Wiley and Sons.
13) Hickman, James, ed., The Jepson Manual, Higher Plants of California, University of California Press
14) Hatch, Charles, Trees of the California Landscape, University of California Press
15) Sawyer, John O., Keeler-Wolf, Todd, A Manual of California Vegetation, California Native Plant Society
16) Ndubisi, Forster (2002), Ecological Planning: A Historical and Comparative Synthesis, John Hopkins University Press

Weekly Course Schedule

Spring 2019	**Topics/Daily Activities**	**Readings and Homework**	**Deliverable/ Due Dates**
Week 1 Jan. 10	1. Course Introduction/ overview 2. Assignments and Research on Individual Designers, Plant Palettes and Group Projects Review/Discussion 3. Lecture/slide show/ discussion: Why study Urban Plant Ecology? Definitions and Concepts	Native Plants/Definitions Handout	
Week 2 Jan. 17	1. Lecture: a. Plant Physiology, Plant Morphology and sustainability b. Developing a functional palette of native and acclimated plants for Southern California c. Plant identification/ Discussion 2. Campus planting identification walk	Bornstein, Carol; Fross, David, and O'Brien, Bart. (2005) California Native Plants for the Garden, Cachuma Press, Chap. 1-4	

Week 3 Jan. 24	1. Lecture: a. Introduction to California native plant communities, species and cultivars b. Site Analysis: opportunities and constraints, climate, soil analysis	ASLA Sustainable Sites Initiative: http://www.sustainablesites.org/ Bakker, Elna. (1984) The Tall Forest. An Island called California: An Ecological Introduction to Its Natural Communities. University of California Press, Second Edition, Revised and Expanded. Pp. 105-142	Field Trip Forms Returned
Jan 29	**Wildfire Field Trip – Joint Class Field Trip to Pepperdine University/Malibu**	TIME TBD	
Week 4 Jan. 31	**Field Trip 1: Sustainable Landscaping: Airport Avenue Demonstration Garden-3200 Airport Avenue, Santa Monica, CA and new Ishihara Park**	Keator, Glenn, and Middlebrook, Alrie. (2007), Designing California Native Gardens: The Plant Community Approach to Artful, Ecological Gardens, UC Press. Chp. 3 Ndubisi, Forster (2002), Ecological Planning: A Historical and Comparative Synthesis, John Hopkins University Press, Chps. 5-7	
Week 5 Feb. 7	1. In Class Plant ID Quiz 1 2. Lecture: a. Plant selection guidelines, hydrozones, microclimates, design and applications in urban landscapes b. Native plants and wildfires	https://www.fire.lacounty.gov/wpcontent/uploads/2017/11/PlantSelection-Guidelines.pdf Perry, Bob, Landscape Plants for California Gardens, Land Design Publishing. Pdf. Pp.44-83 https://www.landdesignpublishing.com/docs/LPCG%20Sections%201-3.pdf	Field Trip Report 1 due In class Quiz 1
Week 6 Feb. 14	**Field Trip 2: Natural History Museum Nature Walk. Plant Identification Assignment**	**https://nhm.org/nature/visit/naturegardens** Keator, Glenn, and Middlebrook, Alrie. (2007), Designing California Native Gardens: The Plant Community Approach to Artful, Ecological Gardens, UC Press. Chap. 7-12	

Week 7 Feb. 21	**Group Research Project A:** Research appropriate planting schemes for various geographies and project types.	Bornstein, Carol; Fross, David, and O'Brien, Bart. (2005), California Native Plants for the Garden, Cachuma Press. Pp. 40-199 (Use book in class)	Field Trip Report 2 due Group Research Project A Due at end of class
Week 8 Feb. 28	**Wildfire Expert Panel** In class discussion with experts from the Fire Dept, native plant societies on the topic: "Landscape strategies for wildfire restoration and wildfire avoidance in the urban wildland interface." (Vegetation management to reduce wildfire risks/wildfire policies of each of the counties in Southern California)	The Fire Department Handouts posted for eight counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura	
Week 9 Mar. 7	1) Lecture/Discussion: a. Plants and Planting for Bio-Diverse Sites b. Invasive plant issues c. Plant Characteristics, Plant communities, Ecology and urban planning	Brenzel, Kathleen. Ed. (1977) Sunset Western Landscaping Sunset Publishing, Corp. pp. 294-337 Oudolf, Piet and Kingsbury, Noel. (2013), Planting: A New Perspective, Timber Press Inc., Pp. 62-76	Individual Report Due: Analysis of discussion from Wildlife Expert Panel
Week 10 Mar. 14	Spring Recess	Oudolf, Piet and Kingsbury, Noel. (2013), Planting: A New Perspective, Timber Press Inc., pp.77-138	
Week 11 Mar. 21	1. In-class Plant ID Quiz 2 2. Lecture/Discussion: Preparing water and energy/carbon budgets for urban landscapes	Perry, Bob, Landscape Plants for California Gardens, Land Design Publishing. Pdf. Pp.18-41 https://www.landdesignpublishing.com/docs/LPCG%20Sections%201-3.pdf	In Class Quiz 2

Week 12 Mar. 28	1. Lecture/Discussion: a. Sustainable landscape practices and opportunities for enhancing urban ecology	The Aga Khan Trust for Culture. (1996), Sustainable Landscape Design in Arid Climates, pp.6-62	
Week 13 Apr. 4	Student Presentations of Research on Individual Designers/Environmental Stewards	Oudolf, Piet and Kingsbury, Noel. (2000) Designing with Plants, Timber Press Inc., pp.40-91	Individual Designers/Environmental Stewards Due
Week 14 Apr. 11	1. Lecture/Discussion: Global perspectives and trends in the sustainability of urban ecosystems	ASLA Landscape Article posted. Articles in sustainability posted	
Week 15 Apr. 18	1. Lecture/Discussion: Future trends in urban plant ecology – green urban infrastructure, therapeutic gardens, urban agriculture, green roofs, green facades, green streets	ASLA Landscape Article posted. Journal of Urban Ecology article posted.	
Week 16 Apr. 25	Last Class Student Presentations of Research Project B – Interactive Campus Map	Articles in Urban ecology	Research Project B Due – Interactive Campus Map
Week 17 May 2-9	Exam Week Final Course Test		Date: For the date and time of the final for this class, consult the USC Schedule of Classes at www.usc.edu/soc.

USC Critical Dates
Spring Semester 2019

Open Registration	Thu-Fri	January 3-4
Classes Begin	Mon	January 7
Martin Luther King's Birthday	Mon	January 21
President's Day	Mon	February 18
Spring Recess	Sun-Sun	March 10-17
Classes End	Fri	April 26

Study Days	Sat-Tue	April 27-30
Exams	Wed-Wed	May 1-8
Commencement	Fri	May 10

Statement on Academic Conduct and Support Systems

Academic Conduct:
This course supports the goal of USC to maintain an optimal learning environment. Students are expected to do their own work and follow general principles of academic honesty including respect for the intellectual property by citing sources of information and ideas that are incorporated into written papers and exercises in this course. All students are expected to understand and abide by the Student Conduct Code found in Scampus, the Student Guidebook.

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* https://scampus.usc.edu/1100-behavior-violatinguniversity-standards-and-appropriate-sanctions. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

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://adminopsnet.usc.edu/department/department-public-safety. This is important for the safety of the 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 http://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.