TEACHING PROPOSAL

Course Content and Structure for Advanced Plants

We will meet twice weekly. During each class, we will spend part of the time discussing reading assignments and field/greenhouse observations. The remainder of the class time will focus on projects related to plant identification, field studies, and planting design.

Introduction The principles of landscape performance will be introduced as a framework for the course. This approach focuses on evidence based evaluation of landscape design. We will use local gardens, especially rain gardens, to test and document landscape performance.

Section 1 We begin with methods of plant identification. The recognition method of plant identification, taught in Landscape Plants I, is an excellent way to get started and we will revisit it. Students will become familiar with common identification guides that use numerous organizations to help them identify plants (e.g. dichotomous keys, color guides, physiognomic groups).

In order to develop and use your plant identification skills, we will visit campus and nearby gardens to measure their diversity. As we visit the gardens we will look at species coverage along gradients, study the soil conditions where they are growing, and (where possible) meet with someone who maintains the garden. These observations will be used to evaluate ecological function as a landscape performance category.

Section 2 We will focus on the interaction of plants with their environment. We will review the relationships between plant characteristics and adaptations to the environment. This section will include at least one greenhouse visit to look at adaptations of plants to arid, tropical, or wetland conditions.

In addition, we will continue to visit gardens and evaluate their fit with their surroundings. We will move from the campus setting to installations in surrounding communities. Are the gardens appropriate to their location? Do they communicate with visitors (through signs or events)? Are they attractors of pedestrians? These observation will be used to measure cultural and aesthetic performance of the gardens.

We will especially take time to meet with people who maintain the gardens and talk about efforts and costs and complaints they deal with. This will give us information related to costs and benefits that may be associated with landscape performance.

Section 3 In order to relate plant diversity, characteristics, and design, a design assignment will require you to develop garden that will have high ecological performance as well as positive and measurable social and economic impacts. Some of the gardeners and property managers will be invited to review your work.

Course Materials and Communication

A sakai site has been established for announcements, exchange of reading materials, assignments, discussions, and questions. Please check it regularly and read the emails generated through this platform.

There are two required books both are very useful as well as inexpensive.

Botany for Gardeners. 2010. Brian Capon. ($10 to $15)

How to Identify Plants. 1957. H. D. Harrington ($6 to$10)

I will provide a small library of recommended books that you can use in my lab (room 130 Blake). Each of you will be expected to become familiar with them and to understand how to use them. Including these Recommended Books:

- *Newcomb's Wildflower Guide.* 1989. By Lawrence Newcomb.
- *Biology of Plants*. 2005. by Peter H. Raven, Ray F. Evert and Susan E. Eichhorn.
- *Botany Illustrated : Introduction to Plants, Major Groups, Flowering Plant Families.* 2006. J. Glimn-Lacy and P. B. Kaufman.
- *Bringing Nature Home: How Native Plants Sustain Wildlife in Our Gardens*. 2007. Douglas Tallamy.
- *Invasive Plants: Guide to Identification and the Impacts and Control of Common North American Species.* 2007. S.R. Kaufman and W. Kaufman.

Readings: Assigned and recommended readings will be mentioned during lectures. They will be available on the sakai site if they are not in your textbooks.

Learning Objectives: Each assignment is based on learning objectives. Some objectives involve strengthening or expanding skills introduced in another class. Other objectives involve the introduction and application of new knowledge and skills.

Course objectives and learning outcomes:

a) Apply plant diversity measures to rain gardens, in order quantify its ecological performance:
   Successful measurement and calculation of diversity.
   Proposal of design alteration to increase biodiversity.
   Clearly explain position on use of native versus introduced species in rain garden design.

b) Test rain gardens for soil characteristics, in order to evaluate its physical performance in water management:
   Characterize soil profile in rain gardens.
   Test porosity and infiltration rates in rain gardens. Propose improvements for soil health.
   Look for evidence of mosquito problems.

c) Evaluate the relationship between the appearance and function of the rain garden and its setting, or its cultural and aesthetic performance.
   Determine if cultural preferences have been addressed.
   Discuss maintenance and problems with caretakers of the gardens. Propose improvements that would better serve that site users.

Student Background: This class covers a broad range of topics. There are a few assumptions made about your background knowledge such as the following:

1. you have taken college level biology
2. you have a working knowledge of the material taught in Landscape Plants 1
3. you are able to identify 20 or more common landscape plants
4. you have an interest in Planting Design.

If you do not meet these assumptions, you may need to do some extra reading or work a little harder. When topics are introduced and applied too quickly, please ask for help.

COURSE SCHEDULE

Sept. 7	Introduction and rain garden in front of Blake Hall (plant id with Newcomb's)
Sept. 11	The plant as an organism
Sept. 14	Rain gardens around Cook Campus Center (plant id and diversity)
Sept. 18	Plant anatomy and morphology review
Sept. 21	Megan Barnes – "Landscape Performance" Rain Gardens by Environmental Sciences (plant id, diversity, soils)
Sept. 25	Plant pollination biology, integrated pest management and expanding our view of ecological performance
Sept. 28	Rain gardens on Busch and Livingston Campus (plant id, diversity, soils)
Oct. 2	Diversity measurements and calculations, which are most useful?
Oct. 5	Rain gardens in Manville (plant id, diversity, soils, setting observation and analysis)
Oct. 9	Soil structure and function review
Oct. 12	Rain garden at Summit Library with Toby Horton (plant id, diversity, soils, setting observation and analysis, maintenance plan)
Oct. 16	Soil performance measures
Oct. 19	Rain gardens in local parks (plant id, diversity, soils, setting observation and analysis, and maintenance plans)
Oct. 23	Ecological function measurement and calculation
Oct. 26	Municipal Rain gardens (part 1) (plant id, diversity, soils, setting observation and analysis, and maintenance plan)
Oct. 30	Measuring design function versus design goals
Nov. 2	Municipal Rain gardens (part 2) (plant id, diversity, soils, setting observation and analysis, and maintenance plan)
Nov. 6	Essentials of rain garden evaluation
Nov. 9	Design development
Nov. 13	Q and A with Toby Horton and Pat Rector
Nov. 16	Site visit and documentation
Nov. 20	Site plans and planting design standards
Nov. 21	Site plans and planting design standards
Nov. 27	Evaluating your design
Nov. 30	Design development – technical drawings review
Dec. 4	Design development
Dec. 7	Final Presentation

ASSIGNMENT DUE DATES

Sept. 14	Initial species list in excel format (5 points)
Sept. 21	updated species list with site richness and evenness (5 points)
Sept. 28	soil description worksheet (5 points)
Oct. 5	updated species list with recommended uses (5 points)
Oct. 12	updated species list with both Shannon and Simpson's diversity index calculated (5 points)
Oct. 19	updated soil performance worksheet with recommendations (10 points)
Oct. 26	suggested rain garden species, based on your observations (10 points)
Nov. 9	in class, Garden evaluations (10 points)
Nov. 16	in class, design concept and program (10 points)
Nov. 30	in class, technical drawings review (10 points)
Dec. 6	noon, Final Drawings and Maintenance Plan (75 points)