

Sustainable Landscape Practices Syllabus

New methods of landscape management are required to restore or protect the ecological services provided by developed landscapes. Students in our programs are the future managers of large nursery and landscape maintenance operations, and need to be versed in techniques that make their operations and their clients' landscapes more sustainable. There is a great demand for these skills in the marketplace, as evidenced by the "greening" of the operations of numerous large landscape and nursery companies, as well as increasing pressure from federal and state agencies to improve on existing ecological outcomes in the landscape. This course is focused on methods for sustainable land management. Ecological systems, services, and processes provide the foundation for decision-making in land management. Included is a survey of sustainable management as it applies to site resources, including water, nutrients, energy and biodiversity. Retrofitting existing development, organic lawn, tree, and shrub care, successional landscapes, permaculture, sustainable materials selection, and best available equipment. This course is an ACCEPtS course offered online to students at the University of Arkansas, Louisiana State University, Mississippi State University and Oklahoma State University.

Instructor:

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Office Hours:

Dr. Schauwecker is available by appointment. Appointments should be scheduled via telephone or email.

Prerequisites: Principles of Horticulture (or equivalent).

Credits:

You will receive 3 semester credits for this course.

Course Objectives:

Upon completion of this course, students should be able to:

1. Evaluate landscape sites with respect to available resources and ecological characteristics

2. Evaluate water availability, quality and drainage issues related to a landscape site
3. Determine how to best manage water on a site
4. Understand techniques for retrofitting landscape sites to make them more ecologically sustainable
5. Understand practices involved in nutrient management for increasing sustainability of a site

Course Progress and Participation:

It is especially important that students set aside a regular time to study the course content and participate in the discussion forum questions. Students who do so learn more and perform better on exams than students who fail to regularly read and work with the course content. Be sure to pay attention to forum deadlines and exam dates. These will help to keep you moving through the course material and up to date.

Failure to complete assignments on time will result in a 0% grade for those activities. Unless an advisor's (in the case of a conflicting university-sponsored activity) or physician's statement (in the case of illness) is provided regarding such failures. NO late work will be accepted.

Required Text:

None

Supplementary Reading:

As provided by the instructor

Other Requirements:

None

Content Delivery Method:

Course content will be delivered using recorded online lectures and slideshows by podcast and computer. Class discussions will be conducted using the course management software and discussion groups. Quizzes and exams will be conducted online. Written assignments will be submitted online using course management software.

Assignments and Grading:

The final grade will be comprised of weekly reading quizzes, 3 exams, and final exam and 2 writing assignments. The assignments and the subject matter associated with each exam are shown below. Specific dates for the exams, quizzes and assignments will be announced at the beginning of the semester. Assignments along with the percent that each counts toward the final grade are listed below.

Writing assignment 1	10%
Writing assignment 2	10%
Reading Quizzes	20%
Exam 1	15%
Exam 2	15%
Exam 3	15%
Final Exam	15%

Internet Etiquette:

Keep in mind that we are addressing each other as professionals, and we must mind our manners. There are no "stupid" questions or comments in this class! Don't be afraid to ask a question or make a comment. Please respect different opinions, perspectives, and values in the discussion board and in all other class activities. Internet etiquette includes not sending e-mail messages in ALL CAPS or too many !!!!!s.

Code of Student Conduct:

It is the responsibility of all students to familiarize themselves with the Code of Student Conduct and other University rules and regulations governing student conduct and activities.

Academic dishonesty:

Academic dishonesty can result in probation, suspension, or expulsion from the course.

As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is

only possible when intellectual honesty and individual integrity prevail.”

Each University of Arkansas student is required to be familiar with and abide by the University’s ‘Academic Integrity Policy’ which may be found at www.uark.provost.edu.

Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

Disabilities Statement:

If you have special needs addressed by the Americans with Disabilities Act, please notify your instructor immediately for proper accommodations.

Make-up Policy:

No late assignments will be accepted and quizzes and exams cannot be made up if missed unless previous arrangements are made with the instructor.

Tentative Course Topics and Schedule:

- I. Introduction
 1. Introduction of course materials, grading, schedule, etc.
 2. Introduction of the need for the course, including regulatory demand, consumer demand, and ethical considerations for the implementation of sustainable practices in the landscape.
 3. Scale: a discussion of inter-relationships from the landscape element scale to the watershed.
 4. Definitions of sustainability and its quantification
- II. Ecological principles in the built environment
 1. Processes
 - a. Ecological principles and their application in the built environment. Student background knowledge in ecology will be varied, resulting in the need to cover the ecological principles and processes that are applicable to this class. A base knowledge of energy flow, flux of matter, disturbance, succession, productivity, competition, resilience, and diversity will set the stage for topics for the rest of the semester.

- b. The effects of development on the hydrologic, chemical, social, and ecological processes in the landscape.
 - 2. Ecosystem services
 - a. A review of the processes by which ecosystems provide tangible benefits and resources to organisms.
 - b. Methods for evaluating the effects of land use change on ecosystem services.
 - 3. Decision-making/design/application of principles – Case study of sites exhibiting maintenance or restoration of ecosystem services
 - a. Crosby Arboretum - ecological design
 - b. Todd Ecological, Inc. – wastewater management and constructed wetlands
 - c. Firewise design at RiverCamps - conservation subdivisions
 - d. City of Portland – urban stormwater management
- III. Resources in the designed and maintained landscape – methods for restoring and maintaining ecological function. Examination of specifications of built works accompanies each of the sub-topics within a main resource topic. Maintenance issues and schedules will be outlined for each of the practices.
 - 1. Water
 - a. Elimination of potable water use in the landscape
 - i. Gray water use
 - ii. Xeriscaping
 - iii. Green roofs/green walls
 - iv. Water harvesting
 - v. Maintaining permeability
 - b. Water quantity calculations
 - c. Maintenance
 - 2. Elements/nutrients
 - a. Too much of a good thing: removal of Nitrogen and Phosphorous
 - i. Bioswales
 - ii. Treatment wetlands
 - iii. Stream buffers
 - iv. Cost and removal efficiency data
 - v. Maintenance
 - b. Treatment of hydrocarbon runoff from impervious surfaces
 - c. Phytoremediation
 - 3. Energy
 - a. Landscaping for home energy conservation
 - b. Solar technology in the landscape
 - c. Wind power in the landscape

- d. Sustainable selection of site materials (i.e. How are landscape materials produced?)
 - e. Maintenance
 - 4. Biodiversity
 - a. Native, non-native and invasive plants in the landscape
 - b. Wildlife corridor establishment and maintenance
 - c. Threatened and endangered species conservation
- IV. Retro-fitting existing development
 - 1. Best Management Practices
 - a. pre- and post-construction BMPs
 - b. BMP maintenance
 - 2. successional landscapes – methods for allowing portions of sites to move toward climax vegetation without making neighbors angry.
 - 3. permaculture – sustainable food production in the urban landscape.
- V. Organic methods
 - 1. Composting – methods for recycling materials produced in the landscape
 - 2. Soil testing
 - 3. Organic landscape products
 - a. Pest control
 - b. Fertilizers
 - c. Mulches
 - 4. Integrated Pest Management
- VI. Equipment – a review of the best available technology for sustainable landscape maintenance and techniques for their use
 - 1. power equipment
 - 2. hand tools
 - 3. sensory technology for the minimization of irrigation