

# Principles of Applied Ecology



**LA 441/541 • 4 Credits**

Fall 2016 • Tu/Th 1:00 pm - 3:50 pm • 231 Lawrence Hall

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Adjunct Instructors: TBA; GTF: TBA

Prerequisites: Undergrad: 1 course in ecology or biogeography. Grad: 1 course in natural sciences.  
Contact the instructor or the Landscape Architecture office for a list of qualifying prerequisite courses.

*Non-majors should contact the Landscape Architecture Office to request enrollment at 541-346-3634 or landarch@uoregon.edu.*

## **Course Objectives:**

By the end of the course, the student should be able to apply ecological understanding toward landscape design, planning and management interventions across a range of spatial scales and land-use contexts using concepts and techniques developed in class.

To this end, we will develop an ecological framework for design that can be applied in any landscape context, at any spatial scale, and regardless of the degree of priority given to human uses, ecological function or biodiversity.

### ***By the end of the course, students will have demonstrated their ability to:***

- Draw upon multiple ecological frameworks to understand how landscapes function as communities, as living systems, as bundles of pattern and process, and as spatial and temporal hierarchies
- Rigorously apply ecological concepts to solving design, planning and management problems
- Develop spatially explicit recommendations for dynamic landscapes where change over time is intentionally guided by incorporating ecological and cultural processes in their management
- Apply the life history needs of native plants and animals toward design, planning and management within a multi-species framework
- Employ a toolbox of ecological concepts and design techniques across a range of spatial and temporal scales and a variety of land uses, from residential properties to watersheds, and from urban cores to nature reserves
- Apply ecological theory and methodologies to spatially-based problem-solving by reading and interpreting the literature, exploring scientific approaches to answering questions, examining case studies, and applying ecological approaches
- Design landscapes that sustain a wide array native species and important ecological functions while addressing people's desires for beauty and personal engagement in urban settings

## **Course Mechanics:**

The course will meet twice per week. The first two periods (1:00-2:50) will focus on the presentation and discussion of class materials. The final period (3:00-3:50) will serve as a lab, and may include instruction, class exercises or time for teams to work on class projects. Classes will encompass a variety of learning formats from lectures to guided in-class exercises, discussions of ecological literature, and outdoor field exercises. ***Students are required to participate in a full-day field trip, scheduled for Saturday 10/17.*** Students unable to attend the field trip must clear it in advance with the instructor and perform an equivalent make-up assignment. ***Final Project presentations will be held during the final exam period, Wed., Dec. 7, 12:30-3:30 PM; all students must attend.***

## **Textbooks and other readings**

### The required texts:

Dramstad, W.E., J.D. Olson and R.T.T. Forman. 1996. Landscape ecology principles in landscape architecture and land-use planning. Washington, D.C.: Island Press. Available as hard copy or e-book.

A course reader and a course packet will be available at the UO Bookstore.

### The optional texts:

Johnson, B. R. and K. Hill. 2002. Ecology and design: frameworks for learning. Washington, D.C.: Island Press. Available as hard copy or e-book. *There are three required chapters for all students, one individualized chapter to read, and others that may be of interest. You may purchase the book if you wish to have the entire set of readings. However, the three required chapters are available on Blackboard and the individualized chapter may be copied from the AAA Reserve copy of the book.*

Forman, R.T.T. 1995. Land mosaics: the ecology of landscapes and regions. Cambridge: Cambridge University Press.

## **Evaluation**

***Final project presentations will occur during the final exam period. Each student must attend class for presentations on that day.***

The course is offered as either graded or pass/no pass. In either case, all assignments must be completed satisfactorily and submitted in a timely fashion to achieve a passing grade. Grades will be based on both individual performance and team projects. The written reading assignments count as a single assignment, and you must receive a minimum of 65% to pass that component. Students will be expected to attend all classes and be on time, including the field trip. On-time class attendance counts for 10% of a student's grade. More than two unexcused absences will result in further deduction of points.

Throughout much of the quarter, students will work in teams of 4-5 people that will serve as the basis for performing in-class exercises, small-group discussions, and the final project. Students will develop team covenants and conduct a mid-project peer evaluation to help develop good team dynamics. At the end of the quarter, students will be asked to provide a final peer evaluation of the relative contributions of their team members.

The university requires that graduate students fulfill requirements beyond those of undergraduates in 400/500 level courses. To this end, graduate students will be asked to complete additional reading assignments, and to exercise leadership in class sessions and team projects.

## **Policy Statement on Academic Honesty**

All work submitted in this course must be your own (or your own team's) and originally produced for this course. The use of sources (ideas, quotations, paraphrases) must be properly acknowledged and documented. Students are encouraged to work together and assist one another, but unless an assignment is specifically assigned as a team project, each student is expected to complete their own work individually. See the UO guide to avoiding plagiarism: <http://libweb.uoregon.edu/guides/plagiarism/students/>.

For the consequences of academic dishonesty, refer to the Schedule of Classes published quarterly. Violations will be taken seriously and are noted on student disciplinary records. If you are in doubt as to the requirements or the nature of specific projects in this regard, please do not hesitate to contact the instructors before you complete the project/activity in question.

## **Information for Students with Disabilities**

The University of Oregon is working to create inclusive learning environments. If there are learning or health considerations that may affect your ability to participate fully in this course, please meet with Prof. Johnson as soon as possible to discuss possible accommodations. If this is a documented disability, please request that the Counselor for Students with Disabilities send a letter of verification.

	Topic and Format	Required Readings	Lab & Prep	Assignments Due
<b>WEEK 1</b>				
<b>TU</b> 9/27	Course Overview & Introduction	Go over course syllabus and course packet	Efficient Reading & discuss teams	- Turn in student survey
<b>TH</b> 9/29	Ecology as Science-Design as Action	- Howett 1998; Ecology & Design: Foreward, Ch1 and selected chapter	<b>Lab:</b> Discuss precedents poster and final project <b>Preparation:</b> Read Final Project	- Required Written Reading Assignment -Fill out online team survey
<b>WEEK 2</b>				
<b>TU</b> 10/4	Ecological Foundations for Design	- Ecology & Design: Ch 3 and Ch. 13	Go over reading assignments; Perform Precedents Study exercise	- Precedent Poster Due - Required Written Reading Assignment
<b>TH</b> 10/6	Community Ecology: Species, Habitats and Communities	- Marzluff & Ewing 2001; Wildlife Notes	<b>Lab:</b> Wildlife Habitat CD & other resources Assign species <b>Preparation:</b> Read Species Project	- Required Written Reading Assignment - Team's assigned
<b>WEEK 3</b>				
<b>TU</b> 10/11	Landscape Ecology: History and Trajectories of Change	- Boyd 1999; Bachelet et al. 2011; optional Christy and Alverson 2011	<b>Lab:</b> Landscape History Class Exercise <b>Preparation:</b> Read Class Exercise. <i>Bring required materials.</i>	- Reading Assignment
<b>TH</b> 10/13	Community Ecology: Plant Community Structure	- Plant Community Notes	<b>Lab:</b> Habitat Delineation Class Exer. <b>Preparation:</b> Read Class Exercise. <i>Bring required materials.</i>	<b>Saturday Field Trip 9:00 – 4:00 PM.</b>
<b>WEEK 4</b>				
<b>TU</b> 10/18	Landscape Ecology: Hierarchy and Scale	- Review Ecol. & Design p. 63-67 & p. 313-314; - Urban, O'Neill & Shugart 1987; Noss 1990 - Hier. and Scale Notes	<b>Preparation:</b> Read Ecol. Site Classif. Notes and Class Exercise <b>Lab:</b> Ecol. Site Classification Exercise and Landscape History Exercise results	- Reading Assignment - Team covenant & list of lead author(s) for project sections due - Hist. Ex. Results, incl. priorities for ecol. restoration
<b>TH</b> 10/20	From Species to Communities: <b>Class Exercise</b>	- Read Species-Communities Class Exercise	Prepare as described and come in costume.	<b>Species Project Due 5 PM of the day prior to class</b>
<b>WEEK 5</b>				
<b>TU</b> 10/25	Community Ecology: Disturbance & Succession	- Ecol. & Design p. 58-61; Connell & Slayter 1977; Davison & Kindscher 1999	<b>Lab:</b> Making/Using Histograms. <u>Bring tree data entered in Excel.</u> <b>Preparation:</b> Histogram and Diversity Notes	- Required Written Reading Assignment - Landscape History first draft
<b>TH</b> 10/27	Landscape Ecology: Concepts and Practice	- Ecol. & Des. p. 314-318; - Textbook, Dramstad, et al.: p. 7-46; - Landscape Ecol. Notes	<b>Lab:</b> Landscape Ecol. Class Exercise. <b>Preparation:</b> Read Class Exercise. <i>Bring required materials</i>	- Submit final project Attachment A

	Topic and Format	Required Readings	Lab	Assignments Due
<b>WEEK 6</b>				
<b>TU 11/1</b>	Restoration Ecology: Theory & Vegetation Management	- Morrison 1987; Hobbs & Norton 1996; SER Primer & Guidelines - Rest. Ecology Notes	<b>Lab:</b> Developing Restoration and Management Plans <b>Preparation:</b> Read Class Exercise. <i>Bring required materials.</i>	- Required Written Reading Assignment - Maps, histograms & sections of historical & current vegetation
<b>TH 11/3</b>	Hydrology: Natural Systems Management	- Naiman et al. 1993, Poff 1997; Schroeder handout + Metro PDF from website	<b>Lab:</b> Urban Hydrology Class Exercise <b>Preparation:</b> Read Class Exercise. <i>Bring required materials.</i>	- Required Written Reading Assignment - Landscape Ecology analysis for Green Infrastructure section
<b>WEEK 7</b>				
<b>TU 11/8</b>	Restoration Ecology: Urban Stormwater Management	- Schueler 1994, & assigned manuals from websites - Urban Hydrology Notes	<b>Lab:</b> Hydrological Intervention Exercise to develop final project requirement	- Required Written Reading Assignment - Park Restoration draft -Residential Audit
<b>TH 11/10</b>	An Ecological Framework for Design	- Mozingo 1997; Nassauer 2004; Malin 1995; - Ecol. Framework Notes	<b>Lab:</b> Residential Design Class Exercise <b>Preparation:</b> Read Class Exercise	- Reading Assignment - Turn in mid-project team evaluation sheet
<b>WEEK 8</b>				
<b>TU 11/15</b>	Urban Open Space Networks Planning	- Cook 1991, Croonquist & Brooks 1993; - Open Space Notes	<b>Lab:</b> Final Project Conceptual Model and Final Project Prospectus Meetings	- Required Written Reading Assignment - Final Project Prospectus & other component drafts
<b>TH 11/17</b>	Experimental Design and Adaptive Management	- Ecol. & Design p. 343-4; - Caughley & Gunn 1996; Cook et al. 2004; Seabloom et al. 2003 - Exper. Design Notes	<b>Lab:</b> Experimental Design: Class Exercise <b>Preparation:</b> Read Class Exercise	- Reading Assignment & 1 Ques./Experiment -Residential Design draft
<b>WEEK 9</b>				
<b>TU 11/22</b>	Urban Ecosystems - Emerging Directions and course wrap-up	- Palmer et al. 2004, Gedge & Gyongyver 2005; Pickett & Cadenasso 2006	<b>Lab:</b> Course Evaluation Conversation & Final Project Prospectus Meetings	- Required Written Reading Assignment - Green Infrastructure draft - Final Project Prospectus & other component drafts
<b>TH 11/24</b>	THANKSGIVING NO CLASS			
<b>WEEK 10</b>				
	<i>Review Week - no class</i>	<b>Final Projects &amp; Peer Evaluation forms due @ 5 PM the day before presentations</b> <b>Final Project Presentation Wed., Dec.7, 12:30-3:30 PM in final exam period</b>		