

# Principles of Applied Ecology



**LA 441/541 • 4 Credits**

Fall 2020 • Tu/Th 12:15-1:45pm & 2:15-3:45pm • Room TBA

Bart Johnson • Department of Landscape Architecture • University of Oregon

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Prerequisites: Undergrad: 1 course in ecology or biogeography. Grad: 1 course in natural sciences.

See the list of recommended [prerequisite courses](#) or contact the instructors.

*Non-majors should contact the Landscape Architecture office to request enrollment at 541-346-3634 or [archadvisor@uoregon.edu](mailto:archadvisor@uoregon.edu). LA 441 can fulfill requirements for ENV5 and ESCI majors, and for LA and ENV5 Minors. LA 541 can serve as a foundation course for the Ecological Design Certificate (ECD).*

## Course Objectives:

By the end of the course, students 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:***

- Apply ecological concepts to solving design, planning and management problems in integrated socio-ecological systems (SESS) in the context of urbanization and climate change
- Develop spatially explicit recommendations for dynamic landscapes where change over time is intentionally guided by incorporating ecological and cultural processes in their management
- 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
- 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 to landscape problem-solving 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
- 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 meets twice per week. The first two periods (1:00-2:50) focus on presentation and discussion of class materials. The final period (3:00-3:50) serves as a lab, and may include instruction, class exercises and charrettes that contribute to the team-based final project. Classes encompass a variety of learning formats from lectures and discussions to guided in-class exercises.

*We do not know yet whether we will be back in normal engagement mode for fall term. If needed, we will practice social distancing and/or remote class sessions. If we are in normal engagement mode, **all 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 their absence in advance with the instructor and perform an equivalent make-up assignment. **Final Project presentations will be held during the final exam period; all students must attend.** Detailed information on grading, attendance, readings, assignments and other course requirements are provided in the Course Packet.*

## **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 in print or as e-book.

A course packet will be available at the UO Bookstore, and contains detailed information on grading, attendance, readings, assignments and other course requirements.

Course readings are available for download on the Canvas course site

### The optional texts:

Johnson, B. R. and K. Hill. 2002. Ecology and design: frameworks for learning. Washington, D.C.: Island Press. Available in print or as e-book.

## **Evaluation**

***Final project presentations will occur during the final exam period. Every student must attend.***

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 term, students will work in teams of 4-5 people that will serve as the basis for 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 term, 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 and Student Conduct**

All work submitted must be your own (or your 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 designated as a team project, each student is expected to complete their own work individually. *Plagiarism* means using the ideas or writings of another as one's own. It includes, but is not limited to: a) the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgement; and b) the unacknowledged use of materials prepared by another person.

Academic Misconduct: The UO Student Conduct Code (<http://dos.uoregon.edu/conduct>) defines academic misconduct. Students are prohibited from committing or attempting to commit any act that constitutes academic misconduct. For example, students should not give or receive (or attempt to give or receive) unauthorized help on assignments or examinations without express permission from the instructor. Students should properly acknowledge and document all sources of information (e.g. quotations, paraphrases, ideas) and use only the sources and resources authorized by the instructor. If there is any question about whether an act constitutes academic misconduct, it is the students' obligation to clarify the question with the instructor before committing or attempting to commit the act. Additional information about a common form of academic misconduct, plagiarism, is available at [researchguides.uoregon.edu/citing-plagiarism](http://researchguides.uoregon.edu/citing-plagiarism).

## **Inclusivity and 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. Furthermore, please notify him if there are aspects of the instruction or design of this course that result in disability-related barriers to your participation. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or [uoac@uoregon.edu](mailto:uoac@uoregon.edu).

	<b>Topic and Format</b>	<b>Required Readings</b>	<b>Lab &amp; Prep</b>	<b>Assignments Due</b>
<b>WEEK 1</b>				
<b>TU 9/29</b>	Course Overview & Introduction	Review course syllabus and course packet	Efficient Reading; Go over reading assignments;	- Turn in student survey
<b>TH 10/1</b>	Ecological Foundations for Design	- Ecology & Design: Ch. 3	Preview Final Project	- Required Written Reading Assignment
<b>WEEK 2</b>				
<b>TU 10/6</b>	Community Ecology: Species, Habitats and Communities	- Marzluff & Ewing 2001; - Lecture Notes	<b>Lab:</b> Review Species Project, Wildlife Habitat CD & other resources; <b>Preparation:</b> Read Species Project	- Required Written Reading Assignment
<b>TH 10/8</b>	Landscape Ecology: Concepts and Practice	- Ecol. & Des. Ch. 13 p. 314-318; - Textbook, Dramstad, et al.: p. 7-46; - Lecture Notes	<b>Lab:</b> Management Species Needs Lab Exercise <b>Preparation:</b> Allocate species and gather materials on each to explore common and divergent needs	
<b>WEEK 3</b>				
<b>TU 10/13</b>	Landscape Ecology: History and Trajectories of Change	- Boyd 1999; Bachelet et al. 2011; optional Christy and Alverson 2011	<b>Lab:</b> Conservation/Restoration Priorities Charette <b>Preparation:</b> Read Lab Exercise. <i>Bring required materials.</i>	- Reading Assignment - Team covenant
<b>TH 10/15</b>	Community Ecology: Plant Community Structure	- Lecture Notes	<b>Lab:</b> Habitat Delineation Lab Exercise <b>Preparation:</b> Read Lab Exercise. <i>Bring required materials.</i>	<b>Saturday Field Trip 9:00 – 4:00 PM.</b>
<b>WEEK 4</b>				
<b>TU 10/20</b>	Landscape Ecology: Hierarchy and Scale	- Ecol. & Des. Ch. 3 p. 63-67 & Ch. 13 p. 313-314; - Urban, O'Neill & Shugart 1987; Noss 1990 - Lecture Notes	<b>Lab:</b> Diagnosing Biological Integrity and Ecological Health Lab Exercise <b>Preparation:</b> Read the Lab Exercise.	- Reading Assignment
<b>TH 10/22</b>	Species Day: <b>Lab Exercise</b>	- Read Species Day Lab Exercise	Prepare as described and come in costume	<b><u>Species Project Due 12 PM the day prior to class</u></b>
<b>WEEK 5</b>				
<b>TU 10/27</b>	Community Ecology: Disturbance & Succession	- Ecol. & Design Ch. 3 p. 58-61; Jentsch 2007; Davison & Kindscher 1999	<b>Lab:</b> Restoring Fire-Adapted Ecosystems Lab Exercise - Making/Using Histograms. <b>Preparation:</b> <u>Bring selected Elliott Hill histogram data in Excel.</u>	- Required Written Reading Assignment
<b>TH 10/29</b>	Restoration Ecology: Theory & Practice	Hobbs & Norton 1996; Gobster 2012; SER Primer & Guidelines; Suding 2004 (grads only) - Lecture Notes	<b>Lab:</b> Restoring Fire-Adapted Ecosystems Charrette <b>Preparation:</b> Read Charrette Prep. <i>Bring required materials.</i>	- Required Written Reading Assignment

	Topic and Format	Required Readings	Lab	Assignments Due
<b>WEEK 6</b>				
<b>TU 11/3</b>	Hydrology: Natural Systems Management	See reading assignment article list + Metro PDF	<b>Lab:</b> Restoring Flood-Adapted Ecosystems Lab Exercise <b>Preparation:</b> Read Lab Exercise. <i>Bring required materials.</i>	- Required Written Reading Assignment
<b>TH 11/5</b>	Restoration Ecology: Urban Stormwater Management	Walsch et al. 2016; Booth et al. 2016; Brabec 2009; Schueler 1994 & assigned manuals from websites - Lecture Notes	<b>Lab:</b> Restoring Flood-Adapted Ecosystems Charrette <b>Preparation:</b> Read Charrette Prep. <i>Bring required materials.</i>	- Required Written Reading Assignment
<b>WEEK 7</b>				
<b>TU 11/10</b>	Reimagining Residential Design	Goddard et al. 2010; Cameron et al. 2012; Kaplan & Kaplan 2003; Malin 1995; - Lecture Notes	<b>Lab:</b> Residential Design Charrette <b>Preparation:</b> Read Charrette Prep. <i>Bring required materials.</i>	- Reading Assignment - Turn in mid-project team evaluation sheet
<b>TH 11/12</b>	Global Environmental Change & Novel Ecosystems	- IPBES. 2019; Hobbs et al. 2014	<b>Lab:</b> Green Infrastructure Lab Exercise <b>Preparation:</b> Read Lab Exercise. <i>Bring required materials.</i>	- Reading Assignment
<b>WEEK 8</b>				
<b>TU 11/17</b>	Urban Open Space Networks Planning and Green Infrastructure	- Ahern 2013; Croonquist & Brooks 1993; - Lecture Notes	<b>Lab:</b> Green Infrastructure Charrette. <b>Preparation:</b> Read Charrette Prep. <i>Bring required materials.</i>	- Required Written Reading Assignment
<b>TH 11/19</b>	Emerging Directions in Ecological Applications	Golden 2015; + explore guest panel papers per reading assignment	<b>Lab:</b> Work on Final Project Synthesis (conceptual framework diagram optional) <b>Preparation:</b> Plan team goals/needs for lab ahead of time	- Reading Assignment - Come with questions for panel
<b>WEEK 9</b>				
<b>TU 11/24</b>	Urban Ecosystems - Emerging Directions and course wrap-up	- Aronson et al. 2017; Pickett et al. 2003; Childers et al. 2015;	<b>Lab:</b> Key Ecological Lessons Conversation & Final Project Meetings	- Required Written Reading Assignment
<b>TH 11/26</b>	THANKSGIVING NO CLASS			
<b>WEEK 10</b>				
	<i>Review Week - no class</i>	<b><u>Final Projects &amp; Peer Evaluation forms due 5 PM the day before presentations</u></b> <b><u>Final Project Presentation Thurs., Dec. 10, 12:30-3:30 PM in final exam period</u></b>		