

**The Johns Hopkins University
Krieger School of Arts and Sciences**

**Advanced Academic Programs: Environmental Science and Policy Program
Fall 2016 - Syllabus
420.611.06/56 -- Principles and Methods of Ecology**

Instructor: Dr David Curson

Phone: 410-558-2473 (office); 410-386-6345 (cell)

E-mail: dcurson1@jhu.edu. Please contact me by e-mail rather than by phone, unless it is urgent. All students and faculty are required to use university e-mail addresses. However, please send e-mails also to my Audubon address dcurson@audubon.org , which I use every day. I respond to e-mails within 24-48 hours.

Class meetings:

Mondays 6:00 – 8:45pm: Baltimore Homewood campus, Room 623 (video conference room).
Washington DC campus, Room 810 (video conference room).

2 required weekend field trips; Saturday 24 September; Saturday 19 November.

Textbook:

Krebs, Charles J. (2009) *Ecology: The Experimental Analysis of Distribution and Abundance* (6th edition). Pearson Benjamin Cummings.

Course description

Ecology is a vast subject and includes many different levels of organization of biological systems, from individuals to ecosystems and the entire biosphere. In this course we will focus on three organizational levels: individuals, populations, and communities. Although population and community ecology comprise most of the topics we will cover, the important role of evolutionary forces acting on individuals to producing patterns at higher levels, will be stressed throughout.

The goals of this course are threefold:

- 1) To provide you with a basic framework of the science of ecology and an understanding of its key concepts.
- 2) To provide you with the scientific background necessary to understand issues in ecological management and conservation that you may encounter as a professional.
- 3) To give you familiarity with reading and interpreting scientific literature in the field of ecology.

Blackboard course website

A course website has been set up on Blackboard, where you can download resources for the course, including this syllabus and class schedule, articles for discussion, lecture presentations and supporting materials for field trips.

Lectures

Each week a lecture will be given. The lecture topics will follow the broad outline of the course text, Krebs' Ecology, but will also include additional material. Readings from the text will be assigned to accompany each lecture. Be sure to complete the relevant readings before each week's lecture. Exams will be based on the lecture material. Each week the lecture will be posted on the class Blackboard website after the class in which it is given.

Discussions

A large part of each class session will be devoted to discussion of one or more research articles from the scientific literature. Articles for discussion will be selected to reinforce understanding of the concepts introduced in lecture. This is an important part of the class and participation in discussions will be graded (20% of the overall grade), so make

sure you read the article(s) beforehand and come prepared to discuss them. Articles are listed on the class schedule and can be downloaded from the Blackboard course website.

Homework

Several assignments will be given throughout the semester. These will include the field reports (see Field trips), short essay questions and problems.

Field trips

The two required weekend field trips will last all day. Each trip will have a particular theme and activity. The trip on October 3 to Soldier's Delight and Oregon Ridge Park will focus on the ecology of a rare serpentine grassland habitat and sampling aquatic macro-invertebrates in a stream environment. The trip on November 14 to Patuxent National Wildlife Research Center will focus on the many ecological studies that have been done at this site. You will write up each trip as a field report *due in the first Monday class session after the field trip*. Items to bring on field trips:

Lunch, water bottle, and any snacks you'll need to get you through the day.

Binoculars

Field notebook , Field guides for species identification

Plastic bags to keep books dry in case of rain.

Guidelines for field trip reports:- Your field trip reports are meant to document the ecology and ecological management of the sites we visit, your activities and methods at the sites, and the species and habitats that we encounter. Please set the line-spacing to 1.5 in your report to leave room for my written comments in the text. For each site we visit split the report into the following sections:

Introduction – Provide a brief background on the sites we visit including ownership and extent and why we visited the site, and where relevant, information on history, geography and ownership. It is your job to determine how much of this sort of detail is relevant to our visit, according to the theme of our visit.

Methods – Describe our activities at the site. On some trips, there will be detailed methods to describe. On others we will simply visit habitats and discuss them.

Results and Discussion – On some trips you will collect data, on others your “results” will mostly be notes taken from our field discussions or a guest lecturer. Data collected should be presented in a table but should also be described and interpreted in text. This will be the longest section of your reports. Describe and interpret the habitats and their ecology and management of the sites we visit – we will discuss these during each trip. Take care to use correct names for species we see and discuss – take careful notes and use further resources (field guides, the internet etc) to get the names right. Use English names for all species, but also add scientific names for the plants that we discuss. Scientific names should be in *italics* with the first letter of the Genus name capitalized.

Please complete the required Student Field Trip Release and Waiver Liability form. This is available online, AAP website => Current Students => Forms => Travel Waivers and Release Forms => Student Field Trip Release and Waiver of Liability Form. **THIS MUST BE DONE BEFORE THE FIRST TRIP.** JHU no longer reimburses students for mileage driven on field trips.

Presentations

In the final class sessions each student will give a 10 minute presentation to the class. Also you must hand in a printed copy of your slides/overheads (but you do **not** need to write a paper). The presentation should address an important question in ecology using recent scientific literature to present an in-depth analysis of the current state of research and knowledge of the issue. You can choose either a theoretical or applied ecological issue (conservation, management problem etc.). **In either case you must relate the issue to the scientific theory you have learned in this class.**

Your presentation must be more than simply a summary of a topic – you need to focus on a specific question (so you need a “?” in the title!), and then present evidence from the literature. Finally you must come to a conclusion based on this evidence. Picking a good question can be a challenge – as a guide, try to come up with a question for which there are two (or more) possible alternative answers. You must include in your presentation references of the research articles you used, and also include some relevant data from one or more articles.

You should let me know (by e-mail) the question your presentation will address by 31 October.

Exams

There will two in-class exams: a mid-term exam will cover all material up until the exam, and a final in the last class session will focus primarily on the material covered after the mid-term but may also include material from the early part of the course.

Grading

Attendance at all field trips and class sessions is mandatory. If you need to miss a session please see me beforehand.

Mid-term exam	40 pts
Final exam	40 pts
Field trip reports	30 pts
Homework	30 pts
Participation in discussions	40 pts
Presentation	<u>20 pts</u>
Total	200 pts

Grades will be determined on the following letter scale:

98–100% A+	84–87% B
94–97% A	80–83% B-
90–93% A-	70–79% C
88–89% B+	<70% F

JHU Ethics Statement

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Report any violations you witness to the instructor. Please also read and adhere to JHU's policy: <http://advanced.jhu.edu/students/plagiarism/>.

Disability statement

The Johns Hopkins University is committed to providing reasonable and appropriate accommodations to students with disabilities. Students in Advanced Academic Programs (AAP) who are in need of accommodations should visit <http://advanced.jhu.edu/current-students/current-students-resources/disability-accommodations/> for the appropriate steps and documentation needed. Requesting accommodations before the semester is preferable, but not required. The student should submit the Request for Accommodation Form prior to the beginning of each semester (s)he is registered to ensure that accommodations continue for that semester. Depending on the accommodation, there may be a time delay before accommodations can be implemented.” More about this is available at this [weblink](#). For any AAP disability matters please use this email alias: aapdisability@jhu.edu .

Dropping the course

You are responsible for understanding the university's policies and procedures regarding withdrawing from courses and you should be aware of the current deadlines and penalties for dropping classes.

JHU Env. Science 420.611.06/56 : Principles and Methods of Ecology
Class schedule – Fall 2016

	<u>Date</u>	<u>Reading</u>	<u>Lecture Topic</u>	<u>Discussion/other</u>
1	Aug 29	Ch. 1, 2.	Introduction to course. Introduction to ecology; evolution and the species concept	Lecture (evolution)
	Sep 5		Labor Day – no class	
2	Sep 12	Ch. 3.	Behavioral ecology	Evolution video: What Darwin never saw. Hand out Hwk 1.
3	Sep 19	Ch. 4, 6, 7.	Analyzing distributions; abiotic factors limiting distributions	Discussion 1. Heard. 1992. Musk-ox group size.
	Sep 24		Field trip to Soldier's Delight and Oregon Ridge Park (all day)	
4	Sep 26	Ch. 8, 9.	Characteristics of populations; Population dynamics	Discussion 2. Mladenoff et al. 1995. Wolf habitat suitability.
5	Oct 3	Ch. 5, p.61-72 Ch. 14, p.271-272 Ch.17	Spatial population dynamics and conservation biology; the role of dispersal, habitat selection, and landscape heterogeneity.	Prep. Hwk 2: Pop. dynamics
6	Oct 10	Ch. 5, p.75-79 Ch. 10	Interspecific interactions: competition and the niche concept	Discussion 3. Van Horne, B. 1983. Brawn, J. D., and S. K. Robinson. 1996. Source-sink
7	Oct 17	Ch. 5, p.72-74 Ch. 11	Interspecific interactions: predation	Review for mid-term exam
8	Oct 24	Ch. 6, p.74-75 Ch. 12, 13	Interspecific interactions: herbivory, mutualism, parasitism	Midterm exam
9	Oct 31	Ch. 18	Ecological communities, succession	Discussion 4. Perry et al. 2007. Chesapeake Bay ducks.
	Nov 19		Field trip to Patuxent National Wildlife Research Center (all day). Date TBD	
10	Nov 7	Ch. 19	Biodiversity	Discussion 5. Hawkins et al 2003. Global species diversity gradient.
11	Nov 14	Ch. 20	Community organization in equilibrial communities: trophic structure, keystone species	Discussion 6. Estes, J. A., M. T. Tinker, T. M. Williams, and D. F. Doak. 1998. Killer whale predation on sea otters
12	Nov 21	Ch. 21	Community organization in nonequilibrium communities: disturbance, island biogeography.	Discussion 7. TBD
13	Nov 28		Ecosystem focus in conservation: Tidal marshes and climate change reading TBD	
14	Dec 5		Student presentations	
15	Dec 12		Final exam	Student presentations