

Principles of Ecology (11:216:351)
Spring 2015
Mon. & Thurs. 9:15 – 10:35
Hickman 101

Instructors: Dr. Henry John-Alder, ENR 152, henry@aesop.rutgers.edu
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Note: the ENR building is at 14 College Farm Road, Cook Campus

Office Hours: By appointment.

Course Description:

Principles of Ecology is a comprehensive, introductory course about interactions between organisms and their environments. Principles of Ecology will introduce basic ecological principles and will describe ecological applications in the face of global change. An overarching goal of the course will be to convey the interconnectedness of levels of ecological organization.

Principles of Ecology is open to all who have completed general biology, but it should be viewed as an upper-level course most appropriate for juniors and seniors. The presentation of the course will assume that students recall and understand basic biological principles. Some knowledge of mathematics, chemistry and physics will be helpful.

Course Learning Goals:

In brief, Principles of Ecology has three broad objectives:

- 1) To understand the diversity of interactions between organisms and their environments, with a particular focus on general ecological principles that allow organisms to live and thrive in environments ranging from hot to cold, wet to dry, and tropical to polar; from terrestrial to aquatic, from marine to freshwater.
- 2) To understand the breadth of the discipline of ecology and the integrative nature of the field.
- 3) To understand that a basic level of ecological knowledge is critically important for the well-being of humanity, especially in the face of world population growth, increasing urbanization, and global change.

Required Text: Cain, Bowman, and Hacker, 2011. *Ecology*, 3rd edition (Sinauer)

The text is currently available in several formats, ranging from traditional hardbound to online rental. Price options – and affordability – vary accordingly. The publisher maintains a companion website at <http://sites.sinauer.com/ecology3e/>. Supplemental readings will be posted as PDF files on the class Sakai site (<https://sakai.rutgers.edu/portal>).

Lectures will generally be closely linked to the textbook, with nearly every lecture linked to its own chapter. Thus, the schedule of readings is ambitious (see below), and it is very important not to fall behind. To optimize your likelihood of performing to your full capability, you absolutely will need to have your own copy of the textbook.

Evaluation:

Evaluation will be based on three multiple-choice examinations (two hourly exams @100 points, one final exam @150 points), and ten *unannounced* multiple-choice quizzes @5 points. The final grade will be based on the total of 400 points.

Exams: The two hourly exams will be given during regularly scheduled class periods (see below), and the final exam will be given during the regularly scheduled final examination period. Each hourly exam will cover the preceding eight or nine lectures. The final exam will cover the final nine lectures, and one-third of the final exam will cover material from the first two sections of the course (i.e., from the first two exams).

Quizzes: Unannounced quizzes will be given promptly at 9:15 in each of ten randomly selected class periods. Each quiz will consist of four multiple-choice questions based on the most recent previous lecture. Each quiz will be open for five minutes; no extensions or make-ups will be possible.

The two lowest quiz scores will be dropped, and the average of the remaining eight will be used to calculate points earned out of 50. However, if more than two quizzes are missed, then the total points earned on quizzes will be the sum of all ten quizzes – including missed quizzes. In other words, only two missed quizzes will be excused without penalty.

Absence from exams:

You must provide notification ahead of time if you will have to miss a regularly scheduled exam due to an official university function. Absence from an exam due to illness or other family emergency will be evaluated on a case-by-case basis and will normally require written documentation of the reason for the absence.

Grading Scale:

Final grades will be based on a total of 400 points. Our intent will be to assign letter grades on a strict percentage basis, where A = 90%, B+ = 87%, B = 80%, C+ = 77%, C = 70%, and D = 60%. However, grades will be curved if necessary to compensate for the overall performance of the class.

Availability of notes and PowerPoint slides:

Lecture slides will not be available in advance of lectures. Partial sets of lecture slides will be made available on the Sakai site (<https://sakai.rutgers.edu/portal>) after lectures at the discretion of the professor in charge. These slides will not be complete sets of slides, and they will be devoid of explanatory notes. In other words, much of the material for which you will be held responsible will be made available only during lectures.

Principles of Ecology Schedule of Lectures and Examinations

Jan. 22 Chpt. 1 HBJ-A -- Intro. and Overview; The Web of Life
Jan. 26 Chpt. 2 HBJ-A –The Physical Environment
Jan. 29 Chpt. 3 PJM –The Biosphere; Biomes
Feb. 2 Chpt. 4 HBJ-A – Coping with Environmental Variation: Temperature and Water
Feb. 5 Chpt. 4&5 HBJ-A – Coping with Environmental Variation: Temperature, Energy
Feb. 9 Chpt. 5 HBJ-A – Coping with Environmental Variation: Energy
Feb. 12 Chpt. 6 HBJ-A – Evolution and Ecology
Feb. 16 Chpt. 7 HBJ-A – Life History
Feb. 19 Chpt. 8 HBJ-A –Behavioral Ecology

Feb. 23 First Exam

Feb. 26 Chpt. 9 PJM –Population Distribution and Abundance
Mar. 2 Chpt. 10 PJM – Population Growth and Regulation
Mar. 5 Chpt. 11 PJM –Population Dynamics
Mar. 9 Chpt. 12 PJM - Competition
Mar. 12 Chpt. 13&14 PJM – Predation, Herbivory, & Parasitism

Mar. 16 Spring Break

Mar. 19 Spring Break

Mar. 23 Chpt. 15 JW – Mutualism and Commensalism
Mar. 26 Chpt. 16 JW – The Nature of Communities
Mar. 30 Chpt. 17 JW – Change in Communities

Apr. 2 Second Exam

Apr. 6 Chpt. 18 JW - Biogeography
Apr. 9 Chpt. 19 JW – Species Diversity in Communities
Apr. 13 Chpt. 20 PJM - Production
Apr. 16 Chpt. 21 PJM – Energy Flow and Food Webs
Apr. 20 Chpt. 22 PJM – Nutrient Supply and Cycling
Apr. 23 Chpt. 23 JW – Conservation Biology
Apr. 27 Chpt. 24 JW - Landscape Ecology and Ecosystem Management
Apr. 30 Chpt. 25 JW – Global Ecology
May 4 Wrap Up – The “last” lecture PJM, HBJ-A, JW

Final Exam – As Scheduled During the Final Exam Period