Introduction to Ecology, BI271, Lecture B

Homepage and syllabus for *Introduction to Ecology, BI271, Lecture B*

BI271 Lecutre B, 4 credit hours, fall semester 2017

Ecology is the study of the spatial and temporal patterns of the distribution and abundance of organisms, including causes and consequences. Studying these patterns provides us with the scientific foundation for understanding natural processes and environmental problems. This course will examine ecological interactions at a wide range of scales from the molecular level, through individuals, populations, communities, ecosystems, and ultimately to the biosphere. We will study how these interactions produce the patterns and processes we observe around the world. In the field-based laboratory we will learn to generate testable ecological hypotheses, develop experimental designs to test our hypotheses, and use statistical inference to quantiatively assess the outcome of our experiments, while gaining first-hand familiarity with local ecological communities.

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Ecology is broadly defined as the study the spatial and temporal patterns of the distribution and abundance of organisms, including causes and consequences. Scales of ecological inquiry begin at the molecular level and span through individual organisms, populations, communities, ecosystems, landscapes, and ultimately through the biosphere. A 200-level ecology course will may emphasize the importance of ecological principles for guiding conservation of biodiversity and environmental quality, and draw on empirical examples from temperate, tropical, and polar biomes, including human-dominated ecosystems.
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Professor information

Dr. Christopher M. Moore
Email: cmmoore@colby.edu (Note that I will do my best to respond to emails within 24 hours)
Office: Olin 216
Office phone: 207-859-5745
Calendar:

Titles and names

Students are often curious about how to address their professors. I am comfortable with Dr. Moore, Professor Moore, or Chris. What's most important to me is that we create a culture of mutual respect in the classroom. As a sign of respect to you I will, by default, address you as Ms. and Mr. followed by your last name. Should you have preferred way of being addressed (first name, nickname, etc.), please communicate that to me.

Meeting dates, times, and location

MWF, 9—9:50 AM, in Lovejoy 215

Text

Ecology, 3rd ed., 2013, by Michael L. Cain, William D. Bowman, and Sally D. Hacker, published by Sinauer Associates, Inc. (Note that the 4th ed. published by Oxford University Press in 2017 will suffice)

Learning Goals for Introduction to Ecology

A. Learn the vocabulary and conceptual framework for the science of ecology.
B. Mature in ability to assess scientific literature, with a special emphasis on data interpretation.
C. Apply concepts and principles to topical ecological issues having implications for policy or management.

D. Gain direct experience with generating hypotheses, developing experimental designs and applying statistical analyses to ecological data.

E. Gain first-hand familiarity with local ecological communities.

Concepts to be addressed in Introduction to Ecology

Concept	Topics
Introduction	Definitions, scientific method, graphing, data interpretation
Biogeography	Climate, biomes, island-biogeography, species-area relationships
Evolutionary ecology	Evolution, adaptation, life history
Population ecology	Population growth and regulation, demography, metapopulations, stochasticity
Species interactions	Mutualism, competition, predator-prey, host-parasite
Community ecology	Community structure, food webs, community metrics, succession, metacommunities
Ecosystem ecology	Energy flow, decomposition, primary and secondary production
Nutrient cycles	Global nitrogen, phosphorus, and carbon cycles, human influences, land-atmosphere-ocean interactions

Website

http://mutualismecology.com/Teaching/Ecology

Grading

Lecture, 0.70 of the course grade

Item	Proportion of course	Proportion of lecture (rounded)
Problem sets (3)	0.09 (0.03 each)	0.13 (0.04 each)
Paper critiques (3)	0.09 (0.03 each)	0.13 (0.04 each)
Examination I	0.12	0.14
Examination II	0.18	0.26
Examination III	0.22	0.32

- **Problem sets** will include several quantitative and conceptual problems that are designed to help you apply and more deeply understand some of the concepts covered in the lecture material. There will be one probem set per module, and they will be disributed in lecture and due at the beginning of lecture, two meetings later.
- **Paper critiques** are designed to help you more thoroughly understand the primary mode of scientific vetting and communication: peer-reviewed journal articles. There will be three paper critiques of three different papers throughout the semester, with each subsequent critique designed to be more challenging by asking you to more thoroughly understand and substantively criticize the article.
- **Examinations** are a method used to gauge your understanding of the lecture material while simultaneously rewarding those who have mastered it.

Laboratory, 0.30 of the course grade

Item	Proportion of course	Proportion of laboratory (rounded)
Assignments	0.10	0.33
Practical I	0.10	0.33
Practical II	0.10	0.33

Attendance

Role will not be taken, but regular attendance is necessary for you to succeed in this course.

Lecture schedule (1 introduction, 32 lectures, 3 reviews, 3 assesments)

Colby College is supportive of the religious practices of its students, faculty, and staff and is committed to ensuring that all students are able to observe their religious beliefs without academic penalty. Please see the College's policy on religious holidays.

Meeting	Date	Day	Module	Lecture	Reading
1	9/6	W	Course introduction	Course introduction	
2	9/8	F	Autecology	The domain of ecology	CBH: pp. 8–16
3	9/11	M		Evolution	CBH: pp. 136–148
4	9/13	W		Evolutionary ecology	
5	9/15	F		The ecological niche	
6	9/18	M		Physiological ecology: animals	
7	9/20	W		Physiological ecology: plants	
8	9/22	F		Behavior: individual (e.g., foraging, communiation) and group (e.g., mating, sociality)	
9	9/25	M		Spatial distributions (e.g., Habitat selection, dispersal, geographic range)	
10	9/27	W		Phenotypic plasticity	
11	9/29	F		Life history	
12	10/2	M		Examination I review	
13	10/4	W		Examination I	
14	10/6	F	Population ecology	Population growth	
15	10/9	M		Population limitation	
16	10/11	W		Stage and age structured populations	
17	10/13	F		Metapopulations	
	10/16	M	Fall recess (no class)		
18	10/18	W		Deterministic and stochastic dynamics	
19	10/20	F		Mutualism	
20	10/23	M		Competition	
21	10/25	W		Predator-prey	

Meeting	Date	Day	Module	Lecture	Reading
22	10/27	F		Plant-herbivore/host-parasite	
23	10/30	M		Ecological epidemiology	
24	11/1	W		Coevolution	
25	11/3	F		Examination II review	
26	11/6	M		Examination II	
27	11/8	W	Communities and ecosystems	Biodiversity (evolution, measurements, concepts, biogeography)	
28	11/10	F		Community statics (e.g., measurement, definitions)	
29	11/13	M		Community dynamics: assembly (e.g., niche, neutral)	
30	11/15	W		Community dynamics: metacommunities	
31	11/17	F		Macroecology	
32	11/20	M		Trophic ecology (including food webs, top-down and bottom-up regulation)	
	11/22	W	Thanksgiving recess (no class)		
	11/24	F	Thanksgiving recess (no class)		
33	11/27	M		Energy flows	
34	11/29	W		Carbon cycling	
35	12/1	F		Nitrogen cycling	
36	12/4	M		Biodiversity and ecosystem functioning	
37	12/6	W		Ecology in the Anthropocene	
38	12/8	F		Examination III review	
39	TBA			Examination III	

Academic integrity

Honesty, integrity, and personal responsibility are cornerstones of a Colby education and provide the foundation for scholarly inquiry, intellectual discourse, and an open and welcoming campus community. These values are articulated in the Colby Affirmation and are central to this course. You are expected to demonstrate academic honesty in all aspects of this course. If you are clear about course expectations, give credit to those whose work you rely on, and submit your best work, you are highly unlikely to commit an act of academic dishonesty.

Academic dishonesty includes, but is not limited to: violating clearly stated rules for taking an exam or completing homework; plagiarism (including material from sources without a citation and quotation marks around any borrowed words); claiming another's work or a modification of another's work as one's own; buying or attempting to buy papers or projects for a course; fabricating information or citations; knowingly assisting others in acts of academic dishonesty; misrepresentations to faculty within the context of a course; and submitting the same work, including an essay that you wrote, in more than one course without the permission of the instructors.

Academic dishonesty is a serious offense against the college. Sanctions for academic dishonesty are assigned by an academic review board and may include failure on the assignment, failure in the course, or suspension or expulsion from the College.

Athletic participation

While Colby College is supportive of athletic participation by its students, academics takes priority over athletics. Both NCAA and Colby rules prohibit missing class for practices. In the case of overlapping commitments between class and athletic competitions, the student must meet with the professor as soon as possible to discuss these overlaps. The student may request permission to miss class and make up the missed work; the instructor has final authority either to grant or to withhold permission

Sexual misconduct/Title IX statement

Colby College prohibits and will not tolerate sexual misconduct or gender-based discrimination of any kind. Colby is legally obligated to investigate sexual misconduct (including, but not limited to sexual assault and sexual harassment).

If you wish to speak confidentially about an incident of sexual misconduct, please contact Colby Counseling Services (207-859-4490) or the Director of the Gender and Sexual Diversity Program, Emily Schusterbauer (207-859-4093).

Students should be aware that faculty members are considered responsible employees; as such, if you disclose an incident of sexual misconduct to a faculty member, they have an obligation to report it to Colby's Title IX Coordinator. "Disclosure" may include communication in-person, via email/phone/text, or through class assignments.

To learn more about sexual misconduct or report an incident, visit http://www.colby.edu/sexualviolence/.

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