

BIO 270: ECOLOGY AND EVOLUTION

WINTER SEMESTER, 2009

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Lecture: MWF 9:30am, Carnegie 339
Laboratory: M or T 1:05pm, Carnegie 430

Ryan's office hours: M 11:00am – 1:00pm
Th 12:00pm – 1:00pm
and open door policy

AI: Greg Anderson
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COURSE DESCRIPTION

An introduction to ecological and evolutionary patterns, principles, and processes. Topics include life history and adaptation, speciation, population dynamics and interactions, community structure, and ecosystem processes. Laboratories include experimental investigations of several levels of biological organization using cooperative lab groups. Prerequisite: Bio 101.

REQUIRED TEXT

Smith TM, Smith RL. *Elements of Ecology*, 7th ed. Benjamin Cummings: San Francisco, 2009.

The laboratory guide “Biology 270 – Laboratory Guide, Winter 2009” is available in the bookstore. Additional readings will be assigned.

LECTURE SLIDES

Lecture slides will be available through Lyceum. Slides will be posted by 5:30pm on the day preceding the lecture. These materials are intended to supplement the lectures and to facilitate studying – they will not be distributed if attendance appears to suffer.

LABORATORY

The laboratory exercises are built around three major studies (Acid Rain, Pine Tree Demography, and Rocky Intertidal Community Structure). The Pine and Rocky Intertidal studies involve data collection in the field – you are expected to come prepared to these labs with clothing appropriate for the weather. Field trips must leave promptly at the designated times; arriving late will result in missing the lab and associated credit.

The website for this course (<http://abacus.bates.edu/~ganderso/biology/bio270/ecology.html>) contains important information related to the laboratory such as deadlines, available resources, and lists of relevant scientific references. You should become familiar with this website. Additional announcements will be distributed via the course e-mail list (wbio270a@lists.bates.edu).

GRADING AND POLICIES

Final grades will be calculated based on the following factors:

	<u>DATE</u>	<u>CONTRIBUTION</u>
<u>LECTURE:</u>		
Exam 1	2/25	20%
Exam 2	3/27	20%
Exam 3	4/14	25%
<u>LABORATORY</u> ^a :		
Pine Lab		13%
Complete draft for peer review	2/13	
Peer review	2/23	
Final Paper	3/2	
Acid Rain Lab		13%
Complete draft for peer review	3/13	
Peer review	3/16	
Final Paper	3/23	
Rocky Intertidal Lab Discussion	4/6 or 4/7	6%
Homework	1/21, 1/28	3%

^a Please see the schedule in the laboratory guide (p. 6) for a complete list of due dates.

≥90%, some kind of A; 80-89%, some kind of B; 70-79%, some kind of C; 60-69%, some kind of D; <60%, F.

Exams: There will be three exams consisting of short-answer and essay questions. Exams will cover lecture, readings and laboratory; the third exam will be cumulative. Make-up exams will not be given unless you contact Ryan prior to the exam and have an excuse from the Dean of Student's office; no-shows will be given a zero score. Please let Ryan know prior to the first exam if you require alternative testing arrangements. You should bring a calculator to all three exams.

Laboratory reports: Each lab team will write two complete laboratory reports using the PI system (Pine, Acid Rain) and give one oral presentation (Rocky Intertidal); information on the PI system is available at <http://abacus.bates.edu/~ganderso/biology/resources/pi.html>. Raw data will be shared among laboratory teams, however teams are expected to work independently on data analysis, data interpretation and writing except where explicitly told otherwise by the course staff; there will be frequent opportunities to consult with laboratory instructors, TAs and TWAs. Laboratory reports must be written in accordance with the "Bates College Statement on Plagiarism" (<http://abacus.bates.edu/pubs/Plagiarism/plagiarism.html>). Late papers will lose 10 points per day; incomplete drafts for peer review will be penalized 3-5 points. Please consult the laboratory guide for additional information on the laboratory reports and related policies.

TENTATIVE SCHEDULE

WEEK OF	LECTURE TOPICS	READINGS IN SMITH & SMITH	LABORATORY TOPIC ^a
1/12-1/16	Abiotic environment and overviews of terrestrial and aquatic ecosystems	Ch. 2 (pp. 19-30) and 3; skim Ch. 23-25	Acid rain lab – plant seeds; Pine lab – introduction
1/19-1/23	<i>No class Monday, 1/19 – MLK Day</i> Statistics (ANOVA, correlation, regression) ^b Genetic and phenotypic variation	Ch. 5	No lab
1/26-1/30	Selection and adaptation	Ch. 5, cont'd	Pine lab – field trip
2/2-2/6	Speciation Measuring and predicting populations: survivorship and life tables	Ch. 9 and 10	Pine lab – data analysis
2/9-2/13	Measuring and predicting populations: life and fecundity tables	Ch. 10, cont'd	Pine lab – results discussion
2/16-2/20	<i>No class 2/16-2/20 – Winter Recess</i>		<i>No lab</i>
2/23-2/27	Intraspecific regulation of populations Exam 1 – Wednesday, 2/25	Ch. 11; skim Ch. 12	Acid rain lab – data collection
3/2-3/6	Life history strategies Competition	Ch. 8 (pp. 167-176) Ch. 13	Acid rain lab – data analysis
3/9-3/13	Exploitation (predation and parasitism)	Ch. 14 and 15 (pp. 309-317)	Acid rain lab – data analysis and results discussion
3/16-3/20	Mutualism Community structure	Ch. 15 (pp. 317-326) Ch. 16	Rocky intertidal lab – introduction
3/23-3/27	Species diversity Exam 2 – Friday, 3/27	Ch. 17 and 19 (pp. 392-401)	Rocky intertidal lab – field trip
3/30-4/3	Succession	Ch. 18	Rocky intertidal lab – data analysis
4/6-4/10	Ecosystem energetics Biogeochemical cycles	Ch. 20; skim Ch. 21 Ch. 22 (pp. 468-477)	Rocky intertidal lab – presentations
	FINAL EXAM – Tuesday, 4/14 at 10:30am		

^a Please see the schedule in the laboratory guide (p. 6) for a complete list of due dates and weekly reading assignments; **we will assume that you have read this material before coming to lab.**

^b This lecture will run until 10:50am. You should review the website “A Painless Guide to Statistics” prior to this lecture at <http://abacus.bates.edu/~ganderso/biology/resources/statistics.html>.