BIOLOGY 471 -- POPULATION ECOLOGY
COURSE SYLLABUS -- SPRING 2010

Any organism can be part of a population regardless of whether it is a snowshoe hare, a willow shrub, a mosquito, or a bacterium. Population ecology is the study of the size, composition, and distribution of populations and the processes that determine these attributes of populations. This course will begin with a detailed examination of the dynamics of individual populations and go on to consider how interspecific interactions impact populations. While this course is strongly focused on the underlying theories of population ecology and the mathematical formulations that accompany these theories, the ultimate goal is always the better understanding of real populations.

Lecture: MW 10:30 - 11:30 am, IRV 201
Lab: W 2:15 - 5:15 pm, IRV 303

Instructor: Dr. Pat Doak
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Office Hours: Thursday 2:30-3:30 pm
and by appointment

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Textbook:
Gotelli, N.J. 2001. *A Primer of Ecology*. 4th Ed. Sinauer Associates, Sunderland, MA. (other additions are also okay)

Prerequisites: A calculus course. BIOL271 or WLF201.

Student Learning Goals:
The successful student should complete this course with an improved understanding of the underlying theories of population ecology, a toolkit of ideas to be applied when trying to understand population dynamics, and a greater ability to apply mathematical and graphical methods to interpreting ecological processes.

Important Course Policies
Plagiarism and Fabrication of Data
Plagiarism and fabrication of data are unacceptable practices both in this course and in science more generally. All of your work should be your own and only your own unless it is explicitly assigned and completed as a group. Plagiarism or data fabrication will result in a course grade of F and possible referral to the University Disciplinary and Honor Code Committee. Also see the 2009-2010 UAF Catalog to review the UAF Student Code of Conduct (online at: http://www.uaf.edu/catalog/catalog_09-10/academics/regs3.html#Student_Conduct). If you have any doubt about whether a particular action constitutes cheating, plagiarism or fabrication of data, please seek clarification from your TA or the course instructor.

Electronic Devises
Cell phones should be off and out of view during both lecture and lab. Likewise you should not be attending to email or browsing the web during lecture or lab time. Doing so will result in your being asked to leave and you will be marked as absent.

Students with Disabilities

Any student needing accommodation of a disability should provide me with a letter from the Office of Disability Services. The Office of Disability Services also requires students contact them at least 3 days in advance of any exam for which they need special arrangements.

Course Mechanics

Lectures and Readings

Students are strongly encouraged to read the text. Exams will emphasize concepts discussed in lecture and lab, but will also cover material from assigned readings.

Grading*

Breakdown:

Exam 1	10%
Exam 2	10%
Final Exam	22%
Quizzes (11)	11%
Lab Exercises (11)	11%
Short Assignments (5)	10%
Problem Sets (5)	26%

*Your final course grade will be adjusted based on your lab attendance. Three unexcused absences will equal a drop of one full letter grade (i.e., B becomes C). Arriving late or leaving before the lab is over will also contribute to your attendance grade. Two unexcused late arrivals and/or early departures will equal one absence.

Overall course grades will be determined using the following scale:

Numerical Score	Grade
90.0-100%	A
80.0-89.9	B
70.0-79.9	C
60.0-69.9	D
below 60	F

Exams

Exams will consist mostly of short essay questions and numerical problems. They will cover lecture, lab, and assigned readings. The final exam will be cumulative. Written requests for re-grades, justifying why the grade was incorrect, must be submitted within one week of the return of an exam.

Lab Attendance and Participation

The lab period may be used for a number of activities: review of lecture material, quizzes, discussions of readings, and computer exercises. You are required to attend ALL lab meetings. If you must miss part or all of a lab, please tell us in advance. Lab attendance will be taken and will impact your course grade as described above. Please show up for lab on time and plan to stay until lab is excused.

Quizzes
Quizzes will be given at the start of lab sessions (with the exceptions of the labs when Exams 1 and 2 are given). The point of the quizzes is to encourage you to review material throughout the semester rather than waiting until an exam. If you have questions on material there will be time to ask them prior to the quiz.

Lab Exercises
The majority of lab time each week will be spent doing a formal lab exercise. It is easy to get distracted by the minutia of completing these exercises and forget that the point is to improve your understanding of the material. We will try to encourage you to think about what you are doing while you go through the motions of doing it. Labs will generally include a brief written assignment that must be completed prior to leaving lab. You will get credit for each lab completed. Sometimes the labs will provide information that is then used in a graded problem set (see below) and lab material often resurfaces on exams (see above).

Short Assignments
During the semester you will have 5 short written assignments. Each will be handed out on a Wednesday and due at the start of lecture on the following Monday. They are usually a single question designed to encourage you to think about the lecture material and draw connections between quantitative descriptions of phenomena and the underlying concepts. You can talk to your classmates or others about these assignments but the work you turn in should be your own. This means that anything you write is written in your own words and any figures are made by you.

Problem Sets
There will be 5 longer problem sets during the semester. These will give you a chance to work through some of the principles we cover in lecture and will usually tend towards the numerical end of things. Most of the problem sets are worth 4 pts, but there will be one longer problem set worth 10 pts. As with the Short Assignments, you can talk to your classmates or others about the problem sets but the work you turn in should be your own. This means that anything you write is written in your own words and any figures are made by you.

Day	Date	Lecture Topic	Reading: Gotelli, 4th edition	Lab Topic
1	Jan 25	Attributes of Populations	pp. XIX-XX	
		Dynamics of Single-Species Populations		
2	Jan 27	Density Independent Population Growth	C1:2-16, 20-22; A:225-229	Introduction; Dispersion
3	Feb 1	Demography and Life Tables	C3:50-59, 74-75	
4	Feb 3	Demography (continued)		Human Demography I
5	Feb 8	Demography (continued)		
6	Feb 10	Intraspecific Competition		Human Demography II
7	Feb 15	Density Dependent Population Growth	C2:26-31	
8	Feb 17	Time Lags and Limit Cycles	C2:32-47; A:229-236	Population Growth
9	Feb 22	Detecting Density Dependence and Cycles		
10	Feb 24	TBA		Density Dependence and Cycles
11	Mar 1	Population Regulation		
12	Mar 3	Life History Patterns	C3:69-71	**EXAM 1**
13	Mar 15	Matrix Models	C3:59-79	
14	Mar 17	More Matrix Models		Matrix Models
15	Mar 22	Matrix Model Example		
16	Mar 24	Space and Metapopulations	C4:82-96	More Matrix Models
17	Mar 29	Space and Natural Populations		
18	Mar 31	Issues with Small Populations	C1:16-20; C2:27, 41-42	Spatial Population Models
		Interspecific Interactions		
19	Apr 5	Interspecific Competition I	C5:100-123	
20	Apr 7	Interspecific Competition II		**EXAM 2**
21	Apr 12	Host-Parasite Interactions and Disease		
22	Apr 14	Disease (continued)		Interspecific Competition
23	Apr 19	Predator-Prey Interactions	C6:126-152	
24	Apr 21	Responses of Predators and Prey		Host-Parasite Interactions
25	Apr 26	Predator-Prey Dynamics		
26	Apr 28	Plant-Herbivore Interactions I		Predator-Prey
27	May 3	Plant-Herbivore Interactions II		
28	May 5	TBA		