Ecology

Biology 325 Spring 2010

GENERAL INFORMATION
Time, Place: MWF 10am, BI 212
Instructor: David Hooper **Office:** Biology 307 **Phone:** 650-3649 **Email:** hooper@biol.wwu.edu
Office Hours: W 1:30-2:30, F 11-12, and by appointment.

Text: M. Molles, "Ecology: Concepts and Applications, 5th ed.", required. Keeping up with the reading assignments is critical. Reading the assigned chapters *prior to* lecture will help immeasurably in your comprehension of the material and performance in this class. Studying the relevant parts of the "Summary Concepts" and "Review Questions" at the ends of chapters is recommended, whether or not the entire chapter has been assigned for reading. Additional reading may be required.
Web site: http://fire.biol.wwu.edu/hooper/courses.html

COURSE DESCRIPTION:
Ecology is the scientific study of the interactions of organisms with each other and with their physical environment. In this class, we will explore both patterns of organism distribution and effects on the environment and the mechanisms underlying those patterns. We will do so by exploring three major issues: elevated CO_2 and global warming, the biodiversity crisis, and human population growth. For each topic, we will examine ecological patterns and mechanisms at a variety of different spatial and temporal scales, from the physiological, to population, community, ecosystem, and global. At each level of this hierarchy, we will aim for an understanding of the chemical, physical, and biological processes that influence ecological interactions, as well as how the different levels of the hierarchy are linked.

COURSE GOALS:
1. Develop an understanding of how organisms interact with their environment and the consequences of those interactions across ecological scales.
2. Develop an understanding of pattern and mechanism in ecology.
3. Develop an understanding of how the scientific process is employed in ecology.
4. Develop an understanding of how ecology can be applied to environmental problem-solving.
5. Develop skills in quantitative analysis, synthesizing ideas, critical thinking, applying knowledge to novel situations.

COURSE GRADE:
1. Your grade will be based on a total of 345 possible points:

2 midterms - 60 points each	120 points
Final exam (comprehensive)	100 points
7 quizzes – 10 points each	70 points
3 homeworks – 20 points each	60 points
	350 points total

2. Exams: Midterm I – Fri, 4/23
Midterm II - Fri, 5/21
Final – Thurs, 6/10, 10:30-12:30
Exams will be a mix of multiple choice, short answer, and essay. Make-up exams are allowed only with a valid, *pre-approved* excuse, and will have different questions from the original exam. Regrades: If, after checking the answer key, you feel I have made an error in grading your test, please bring it to my attention. Regrades must be brought in no later than one week after the test is returned.
3. Homeworks – We have three homework assignments that involve reading a journal article and using the material from lecture and textbook reading to critically evaluate questions related to that article. See details in related handouts.
4. Extra credit: You can earn a MAXIMUM of 10 POINTS by writing a summary of an article from a scientific journal (article to be assigned by me) or a seminar relating to the course. The summary should be 2 typed, double-spaced pages, applying relevant ecological concepts from class. Points will depend on the quality and thoughtfulness of your written summary. **Only one summary (article or seminar) per student.**
   - Seminar summaries are due one week after the seminar takes place.
   - Journal article summaries are due on the last day of classes.
5. Your final grade will be determined as a percentage of the point total. The following scheme will give you an idea of your performance, but I may adjust these grading criteria depending on the final distribution of scores.

		B+	87-89.9	C+	77-79.9	D+	67-69.9	F	0-59.9
A	93-100	B	83-86.9	C	73-76.9	D	63-66.9		
A-	90-92.9	B-	80-82.9	C-	70-72.9	D-	60-62.9		

Dates	Lecture Topics	Reading
Week 1		
W, 3/31	Introduction to the class	Chap. 1
	The Carbon Cycle and Global Change	
F, 4/2	Human changes to global element cycles	Chap. 23: 514-16; 529-36
Week 2		
M, 4/5	The carbon cycle and production	Chap. 18: 399-411 Chap. 19: 423-4
W, 4/7	Carbon cycle and production (continued)	
F, 4/9	C cycle continued: Decomposition **(Quiz)**	Ch. 19: 424-429
Week 3		
M, 4/12	Plants – Photosynthesis, effects of resource availability **(Homework 1)**	150-6, 163-4, 167-70
W, 4/14	Photosynthesis, continued	
F, 4/16	Climate and biomes **(Quiz)**	Chap. 2
Week 4		
M, 4/19	Adaptation and tolerance	
W, 4/21	Temperature regulation and adaptation – animals and plants	Chap. 5
F, 4/23	**Midterm I** – Carbon cycle and global change	
Week 5		
M, 4/26	Water regulation and adaptation – animals and plants	Chap. 6
W, 4/28	Water – continued	
	Population Growth	
F, 4/30	Human population growth; Population distribution and abundance **(Quiz)**	Ch. 9 + 257-60
Week 6		
M, 5/3	Intrinsic rates of increase, exponential and logistic growth	Ch. 11
W, 5/5	Exponential and logistic growth, continued	
F, 5/7	Life tables **(Quiz)**	Ch. 10
Week 7		
M, 5/10	Life tables, con't	
W, 5/12	Life history strategies **(Homework 2)**	Ch. 12
	Biodiversity	
F, 5/14	Land use change and the biodiversity crisis; concepts in ecological diversity **(Quiz)**	Ch. 23: 524-8; Ch. 16: 358-3
Week 8		
M, 5/17	Diversity, continued; Interspecific competition	Ch. 13
W, 5/19	Interspecific competition, cont'd	
F, 5/21	Predation, parasitism, disease **(Midterm 2)**	Ch. 14 + 156-63, 164-7
Week 9		
M, 5/24	Mutualism	Ch. 15
W, 5/26	Factors regulating diversity and community structure I	Ch. 16: 365-77
F, 5/28	Ecosystem energetics & secondary production **(Quiz) (Homework 3)**	Ch. 17, Ch. 18.: 411-17
Week 10		
M, 5/31	*Memorial Day – no class*	
W, 6/2	Factors regulating diversity and community structure II	Ch. 22
F, 6/4	Community change: disturbance and succession **(Quiz)**	Ch. 20
Week 11		
Th, 6/10	**Final exam**: 10:30 a.m. -12:30 p.m.	