

# SOUTHEAST MISSOURI STATE UNIVERSITY

Department of Biology

BI 502

Fundamental Concepts of Ecology

New Fall 2012

**I. Catalog Description and Credit Hours of Course:**

An introduction to the fundamental principles of ecology. Field trips outside of class time may be required. Does not count toward completion of a graduate degree. Two one-hour lectures and one two-hour laboratory per week. (3)

**II. Prerequisites:** Admission to Graduate Study in Department of Biology. Thirty semester hours of acceptable undergraduate credit in science and mathematics.

**III. Purpose or Objectives of the Course:** Provide a broad base for understanding modern concepts in ecology.

**IV. Student Learning Outcomes:**

- A. Students will be able to explain how abiotic factors affect species distributions in the landscape.
- B. Students will be able to explain the measured components of the optimal foraging model.
- C. Students will be able to explain the differences between the exponential growth model and the logistics growth model.

**V. Expectations of Students:**

- A. Students attend all lectures and complete all assignments for BI 332, General Ecology.
- B. Demonstrate understanding of material on all assignments and exams by earning a minimum of 80% of possible points.

**VI. Course Content or Outline (include number of periods on each topic):**

A. Lecture Topic	Periods
1. An introduction to the ecological perspective	1
2. The distribution of life	2
a. abiotic variation in space and time	
b. biotic variation in space and time	
c. biomes	
3. Natural selection	3
a. selective agents	
b. the units of selection	
c. population and gene pool	
d. inclusive fitness - the measure of success	
e. modes of selection	

4.	Survival	6
	a. physiological tolerance/resistance and limiting factors	
	b. acclimation and compensation	
	c. bioenergetics	
	d. pollution as a limiting factor	
	e. using space and energy	
5.	Reproduction	5
	a. benefits and costs of asexual and sexual reproduction	
	b. the concepts of parental investment	
	c. sexual selection	
	d. parent-offspring relationships	
6.	The population	6
	a. structure	
	b. models of population growth	
	c. interspecific interactions	
7.	The community and ecosystem	6
	a. concept of the niche - theory and reality	
	b. energy flow and nutrient cycling	
	c. community structure and function	
	d. community response to disturbance	
	e. description of major ecosystems	
8.	Exams	3
<b>B. Laboratory Topics</b>		
1.	Natural selection	1
2.	Physiological tolerance	3
3.	Behavior	3
4.	Population dynamics	3
5.	Community structure and function	5

**VII. Textbook and/or Supplemental Materials:**

Molles. 2010. Ecology: Concepts and Applications. 5<sup>th</sup> edition. McGraw Hill Publishing.

Ambrose. Handbook of Biological Investigations. 7<sup>th</sup> edition. Hunter Publishing.  
Optional book.

**VIII. Basis of Student Evaluation:**

Three unit examinations, quizzes, written laboratory reports, and assignments.

Grading scale:

70%-100% = A

0%-69% = F

**IX. Academic Policy Statement:**

Students will be expected to abide by the University Policy for Academic Honesty regarding plagiarism and academic honesty. Refer to:

***<http://www6.semo.edu/judaffairs/code.html>***

**X. Student with Disabilities Statement:**

If a student has a special need addressed by the Americans with Disabilities Act (ADA) and requires materials in an alternative format, please notify the instructor at the beginning of the course. Reasonable efforts will be made to accommodate special needs.