

**Ecology and Evolution**  
**Fall 2008**  
**ABIO 370 (4 credit hours)**

**Instructor: Dr. Derek Zelmer**  
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Lecture: TTh 8 am - 9:15 am Sciences 107  
Lab: M 10 am - 12:40 pm Sciences 107

**Course text (required)**

Begon, M., C.R. Townsend, and J.L. Harper. 2006. Ecology: from individuals to ecosystems. 4<sup>th</sup> Edition. Blackwell Publishing, Oxford, U.K. 738 pp.

**Course description**

Intended as an introduction to the theoretical and practical concepts of ecology and evolution for biology majors with no previous experience in either field. Students will be responsible for reading assigned scientific literature, and completing written summaries of these readings, as well as utilizing the scientific literature to prepare short essays.

**Prerequisites**

ABIO 122 and AMTH 111 or equivalents.

**Laboratory manual (required)**

Zelmer, D.A. 2008. Ecology and Evolution Laboratory Manual. USCAiken. 50 pp.

**Laboratory description**

The laboratory section of the course will include formal and informal discussions of the methodologies associated with the collection, analysis, and presentation of ecological data, as well as reinforcement of the principles covered in lecture. Students will be responsible for summarizing activities in the form of formal lab reports. Due dates will be assigned as laboratory exercises are completed, but the final lab of the semester is the final date any regular work will be accepted.

**Objectives**

- to familiarize students with the basic ecological mechanisms governing the distributions and abundances of organisms, and the evolutionary principles governing the processes of natural selection and adaptation.
- to familiarize students with the close association between ecological and evolutionary principles and theory.
- to improve the ability of students to identify and analyze ecological and evolutionary processes in the natural world.

**Competencies**

Upon satisfactory completion of this course, students will have demonstrated the ability to:

- discuss basic ecological and evolutionary principles, and understand contemporary

examples that illustrate those basic principles.

- describe the potential mechanisms by which organisms interact and compete for resources.

### **Competencies (cont'd)**

- Describe basic methodologies for collecting, analyzing, and presenting data from ecological experiments.

### **Field Trips**

There may be short excursions to nearby areas during scheduled lab periods. Field activities may include informal lecture and discussion, plant and animal identification, and data collection for analysis in the laboratory.

### **Exam dates**

Lecture exams will be given on **September 16, October 14, and November 11.**

The final exam will be given on **Thursday, December 11 at 8am.**

Exams will consist of definitions, short answer questions, and short essay questions.

### **Exams**

If you are going to miss a lecture exam, you must receive permission from Dr. Zelmer **before** the day of the exam unless it is absolutely unavoidable (e.g., medical note, police report). If an exam absence is unavoidable, there must be a phone call to Dr. Zelmer (641-3472) or the Biology Department office (641-3299) on the day of the examination. **Do not schedule vacations or work for exam days: you will NOT be allowed to make up the exam.**

- make-up exams may be in the form of a 60 minute oral examination.
- quizzes cannot be made-up.
- the final can not be taken early.
- if you wish to contest the grading of a question on an exam, you must do so within one week of the exam key being posted, and **after reading the key.**
- if you wish to contest the grading of an assignment, you must do so within one week of the assignment being returned to you.
- unless otherwise indicated, assignments must be turned in no later than 5pm on the date they are due. Late assignments lose 10% per day.

### **Grading**

Lecture Exams (15% x 3)	45%
Essays, summaries, and lecture quizzes	15%
Lab reports and exercises	20%
Final examination	20%

Extra credit is not available.

### **Attendance**

I will not alter your grade for not attending lectures. I will not have to. If you are absent for a quiz, you will not get to make up the quiz, regardless of the reason (I will drop the lowest quiz score). If you are to be absent for a scheduled exam, I will need to discuss the reason with you

prior to, or the day of, the exam. Unexcused absences from exams will result in a grade of 0 for that exam.

Laboratory attendance is required. Unexcused absences from lab will result in a grade of 0 for assignments pertaining to lab.

### **Grading Scale**

The following grading scale will be applied to the final percentage score derived from the examinations and assignments outlined previously. Grades will not be scaled, curved, or 'bumped'. Extra credit is not available under any circumstance.

A	89.5% - 100%
B+	84.5% - 89.5%
B	79.5% - 84.5%
C+	74.5% - 79.5%
C	69.5% - 74.5%
D+	64.5% - 69.5%
D	59.5% - 69.5%
F	0.0% - 59.5%

### **Academic Dishonesty**

Cheating, plagiarism, and other activities that can be reasonably considered as dishonest will result in a failing grade for the course and, possibly, forwarding of the matter to the University Judicial Committee.

Plagiarism essentially is the theft of 'intellectual property' through an intentional attempt to present another's ideas or work as your own, or through an *unintentional* omission of credit. If you are uncertain as to what plagiarism entails, please discuss it with me.

### **Other Policies**

1. Preparation for class includes reading of assigned material.
2. If you are having difficulty with any aspect of this course, please come and see me as soon as possible. Office hours are a guideline only, I can be reached in person, by phone, or by e-mail to make appointments to meet with you at more convenient times.
3. If you have a physical, psychological, and/or learning disability that might affect your performance in this class, please contact the Office of Disability Services, 126A, B&E Building (641-3609) as soon as possible. The Office of Disability Services will determine appropriate accommodations based on medical documentation.

## Tentative Course Outline

August 21	Introduction to Ecology and Natural Selection
August 26, 28	Conditions and Resources
September 2, 4	Climate and Biomes
September 9, 11	Nutrient Cycling and Energy Flow
<b>September 16</b>	<b>First Lecture Exam</b>
September 18	Population Parameters and Dynamics
September 23, 25	Exponential Growth, Density-dependence
September 30	Logistic Growth
October 2	Life History Strategies I: r and K selection
October 7	Age-Structured Population Growth
<b>October 14</b>	<b>Second Lecture Exam</b>
October 16	Stage-structured Population Growth
October 21, 23	Life History Strategies II
October 28, 30	Population Genetics
November 6	Proximal Mechanisms of Genetic Change
<b>November 11</b>	<b>Third Lecture Exam</b>
November 13	Ultimate Mechanisms of Genetic Change
November 18, 20	Speciation
November 25	Patterns of Evolution
December 2, 4	Evidence for Evolution
<b>December 11</b>	<b>FINAL EXAM (8 am)</b>

## Tentative Laboratory Outline

August 25	The Scientific Method and Experimental Design In Ecology
September 8	Data Collection and Hypothesis Testing: Student's t-test
September 15	Regression and Correlation Analyses
September 22	Sampling Abundance: Mark-Recapture
September 29	Sampling Abundance: Quadrats, Line Transect, and Point Quarter
October 6	Distributions: Random and Aggregated Distributions
October 13	Analysis of Frequencies/Goodness of Fit
October 20	Selection I – Pupation Heights of <i>D. melanogaster</i>
October 27	Selection II – Feeding Rates of <i>D. melanogaster</i> Larvae
November 3	Analysis of Variance
November 10	Selection III – Resistance
December 1	Poster Presentations