

**SYLLABUS: PLEASE READ!**  
**General Ecology - Biology 322**

**Instructor:** Stephen Brewer, Professor of Biology

**Brewer's office/lab:** 412 Shoemaker (office); 409 Shoemaker (lab); email: jbrewer@olemiss.edu; hours 10:00 – 11:45 am, MWF, and by appointment (email is the best way to contact me). If you can't see me during these times, scheduled appointments are welcomed and strongly encouraged. I extend office hours before exams.

**Text (recommended):** W.D. Bowman, and S.D. Hacker, Ecology, M.L. Cain, 4<sup>th</sup> edition, Sinauer. 3<sup>rd</sup> edition by Cain et al. is acceptable also.

**Learning Outcomes:** An important goal of this course is to enhance students' existing curiosity about and understanding of the natural world. After completing this course, you should understand and appreciate relationships between various organisms, including humans, and their environment. In addition, this course will provide a basis for objectively evaluating current issues, particularly those related to ecology, evolution, and human impacts on the environment (and vice versa). These outcomes will be achieved by evaluating performance on traditional exams and laboratory exercises and participation in a class debate.

**Instructions for students:** *All examinations will be based on material covered in lecture, from handouts, and from laboratory material. I will periodically assign reading from the text, but only to provide supportive material for the lecture. You will not be tested on any material from the text that I do not also cover in lecture. For this reason, the text is recommended but not required. Occasionally, material from the laboratory may appear on tests, but I will explicitly state which laboratory material you will need to study. You may be tested on material from handouts, regardless of whether I cover the material in lecture.*

**Attendance and Participation:** Lecture is in Turner 205 Auditorium. You are expected to attend class every session. I will take attendance every class period using an Electronic Scanner. Absences will affect your grade. Although I plan to post lecture notes on Blackboard, several concepts require some explanation, and you need to be in class to hear that explanation.

**Attendance Verification Statement:** If your attendance has not been verified at the end of the third week, and if you have not voluntarily dropped, you will be administratively dropped from the class. This action may have an impact on your financial aid eligibility and full-time status.

**POLICY REGARDING ATTENDANCE AND TARDINESS!** Class starts at 9:00 sharp! You should be seated, with your printed outline, class notes, and associated notes out and in front of you. **The Electronic Attendance Scanner**

**will register you as absent if you arrive after 9:05! If you are late for class or forget to bring your student ID, you must come see me at the end of class and then email me after class, indicating your section number (or when your lab meets). Starting with the 2<sup>nd</sup> instance of tardiness or forgetting your ID, I will mark every such no scan as one-half of an absence. If you don't see me at the end of class when you fail to scan in, I will mark you absent.**

*Pop Quizzes* – Occasionally and without advanced warning, I will give you a short quiz on material that is being covered. Although your quiz will not be graded, you must hand in a quiz with your name on it to get full credit for attendance that day. We'll go over the quiz in class, and I'll post the answers on Blackboard. Hence, please don't risk embarrassing yourself by scanning in and then leaving or having a classmate scan you in.

These quizzes are intended to encourage you to read the class notes AHEAD of time and to give you an idea of the kinds of questions I will ask on my exams.

**Labs begin Tuesday and Wednesday January 28 and 29 and meet in Shoemaker 225.** Attendance in lab is required, and your TA will take attendance at every laboratory session. It is your responsibility to ensure that the TA knows you attended the lab. Assume your TA will mark you absent if you arrive after he has taken roll. Since most labs will be field trips, PLEASE BE ON TIME TO LAB. No make-up labs will be given. ***Check your University email account or Blackboard every Monday morning for laboratory assignments.***

**Electronic Device Policy:** Your personal electronic devices have no place in the ecology classroom and are very distracting. *Except under specific circumstances, in which I direct you to access Blackboard on your device (see Blackboard Quizzes, below), you are not to use ANY electronic device in the classroom at any time. Electronic devices such as laptops, iPads, cell phones, smartphones, iPods, Apple Watches, and similar devices are not to be used at anytime during class time or lab time, except as recording devices. If used as recording devices, they must be placed on a table at the front of the room (but see statement regarding disability accommodations below). Otherwise, these devices must be silenced and stowed; no viewing of their screens is allowed.*

**Class Materials:** To aid in note taking, in addition to writing the outline for the day on the chalkboard at the beginning of class, I will post on Blackboard lecture notes and a tentative review guide for the exam material the first day I begin lecturing on the relevant material. I advise you to print out the lecture notes and bring them to class and read this review guide as soon as possible and see if you can answer as many of the questions as possible using your lecture notes, your text, and/or other resources (e.g., Wikipedia) *in advance* of the lectures. Such advanced preparation will allow you to spend more time *listening* to the lectures, and to ask relevant and probing questions during lecture. These guides are not written in stone, however, and I reserve the prerogative to deviate from the topics covered in the review guide (and to a limited extent the lecture notes).

**Disability Access and Inclusion:** The University of Mississippi is committed to the creation of inclusive learning environments for all students. If there are aspects of the instruction or design of this course (lecture or lab) that result in barriers to your full inclusion and participation, or to accurate assessment of your achievement, please contact me as soon as possible. Barriers may include, but are not necessarily limited to, timed exams and in-class/lab assignments, difficulty with the acquisition of lecture content, inaccessible web content, and the use of non-captioned or non-transcribed video and audio files. If you are approved through SDS, you must log in to your Rebel Access portal at

<https://sds.olemiss.edu>

to request approved accommodations. If you are NOT approved through SDS, you must contact Student Disability Services at 662-915-7128 so the office can: 1. determine your eligibility for accommodations, 2. disseminate to your instructors a Faculty Notification Letter, 3. facilitate the removal of barriers, and 4. ensure you have equal access to the same opportunities for success that are available to all students.

**Requirements, exams, grades, etc.:** The final grade is based on regular exams, a final exam, and a laboratory grade as follows:

Exam 1	25%
Exam 2	25%
Exam 3	25%
Final Exam	25%
Laboratory	25%

-----  
 $125\% - 25\%$  (for lowest regular exam score) = 100%

Grade Scale

- A = 89 - 100%
- B = 79 - 88.9%
- C = 69 - 78.9%
- D = 59 - 68.9%

I have determined with scientific precision that 1% of my questions are screwy and should not be counted against you (hence, the reason for the 1% shift in the grading scale). **This grade scale is fixed in stone. No curve will be applied to your final grade, nor will your final grade be re-scaled.**

How does attendance affect your final grade? As follows:

0 unexcused absences plus from 0 to 2 excused absences – add 1% to the final grade

- 1 unexcused absence plus from 0 to 2 excused absences – add 0.5% to the final grade
- 2 unexcused absences or **3 or more excused absences – no benefit or reduction**
- 3 unexcused absences – subtract 0.5% from the final grade
- 4 or more unexcused absences - subtract 1% from the final grade

All exams are multiple-choice and cover roughly equal amounts of material. The lowest score of the three regular exams will be dropped from consideration of the final grade. The final exam grade will not be dropped under any circumstances. ***The final exam is comprehensive, although it will emphasize material on which you have not already been tested (i.e., Community Ecology and Ecosystems; see below).***

**Test Make-Up Policy** – Test dates are decided in advance and will not be changed. Don't count on being able to take exams whenever you please. **Exams missed due to illness or other legitimate reasons will either be dropped or made up during the final exam period. If you choose to make up an exam, you must notify me ahead of time and be prepared to take it during the final examination after you have completed the final exam.**

Those students who score 90% or better on the first two exams will be given the option of not taking and thus dropping the third exam. These students are still required to attend all lectures leading up to the third exam and thereafter.

**Schedule and Outline**

**Recommended Text Reading**

Introduction	Chapter 1
What is Ecology?	
Ecology vs. Environmentalism	
Ecologists Use Experiments, Observations and Models to Answer Ecological Questions	
Unit 1 - Organisms and Their Environment	
The Physical Environment	Chapter 2
The Biosphere, Biomes, and Local Vegetation Patterns	Chapter 3
Vegetation Types of Mississippi	Not in Text
How Do You “Measure” the Environment?	Chapters 4,6
External, Ecological, and Selective Environments	
Phenotypic Plasticity	Chapters 4,7
Acclimation	
Dormancy and Tolerance of Extremes	Chapter 4
Homeostasis and Circadian Rhythms	
Endothermy and Ectothermy	

**Exam 1 – Monday, February 10**

Unit 2 - Populations	
What are Populations and Why Study Them?	Chapter 8
Population Growth and Regulation	Chapter 9
Exponential Population Growth and $r$	
Geometric Population Growth and $\lambda$	

Growth in Age-Structured Populations	
Density-Dependence	
Practical Application - Sustainable Yield of Fisheries	
Population Dynamics	
Demographic Stochasticity and Environmental Fluctuations	Chapter 10
Population Viability Analysis	
Metapopulations and Dispersal	
What is a Metapopulation?	
What is a Patch?	
What is the Classical Levins Metapopulation?	
What Influences Extinction and Colonization?	
The Conservation Significance of Metapopulations	
Landscape Ecology and Metapopulations	Chapter 23 P 502-514

**Exam 2 – Wednesday, March 4**

Unit 1 (Revisited) Evolution and Ecology	
What is Evolution?	Chapter 6
Mechanisms of Evolution	
Adaptation	
Parallelism and Convergent Evolution	
Speciation	
Sex and Breeding	Chapter 7
What Good are Males?	
Sex and Reduced Competition among Siblings	
Sex and Superfit Offspring	
Sex and the Red Queen Hypothesis	
Social and Altruistic Behavior in Animals	
What is Altruism or Why do Bees Die After They Sting You?	
What is Group Selection?	
What is Kin Selection?	
Life History Analyses	
Life History Trade Offs	
Why Delay Reproduction?	
Advantages of Early Reproduction	
Delaying Age at First Reproduction to Increase Reproductive Output	
Bet-Hedging: Iteroparity, Dormancy and Spreading the Risk of Reproductive Failure	
Why Die? The Evolution of Senescence	
Sexual Selection	Not in Text
Sexy Sons; Choosy Females	
Good Genes; Choosy Females	
Competitive Males	
Life-History Strategies: A Summary	Chapter 7
r-K continuum Theory	

**Exam 3 – Wednesday, April 8**

Units 3 and 4 - Interactions Among Organisms and Communities	
What is a Community?	Chapter 15
Key Properties of Communities	
What is Species Diversity?	
Types of Biological Interactions	Ch 11-14
Interspecific Competition and the Competitive Exclusion Principle	Chapter 11

Lotka-Volterra Predictions	
Limitations of the Competitive Exclusion Principle	Chapter 18
Equilibrium Hypotheses of Species Coexistence	Chapter 18
Disturbances and Diversity	Chapter 18
Succession and Alternative Stable States	Chapter 16
Biodiversity and Human Health:	
The Ecology of Disease - Can Prevention be a Cure?	Chapter 13
The Dilution Effect - A Case Study of Lyme Disease	
Unit 5 - Ecosystems	
What is an Ecosystem?	Chapter 19
Energy Flow and Food Webs	Chapter 20
Production	Chapter 19
The Global Carbon Cycle and Global Warming	
Forests as Sinks and Storage Pools	Chapter 24
Nutrient Regeneration in Terrestrial Ecosystems	Chapters 21,24
Fixation and Loss of N	
Phosphorus and soil pH	
Movement of Energy/Nutrients in Aquatic Ecosystems	
Energy/Nutrient Export from Coastal Marshes	
The Consequences of Species Diversity	Chapter 18

**Final Exam (Wednesday, 8:00 am, May 6, 1 hour, 15 minutes in Turner Room 205)  
– Comprehensive, but 90% of the questions will be on material covered since exam  
3. Make-up exams will be given following the final exam.**

I assume that all students have read the instructions listed above and are familiar with them by January 24. All students are responsible for following the instructions and procedures of this class.

Enjoy the semester!

Steve Brewer