



A M B R O S E

**BIO 213 INTRODUCTION TO ECOLOGY AND EVOLUTION (3)
FALL 2012**

Course Description

The dynamics and maintenance of biological diversity are examined in terms of ecological processes and evolutionary principles.

Further Course Information

Prerequisite: BIO 133

Class Schedule

Meeting Times:

Lecture - Tuesdays and Thursdays 1:00-2:15

Lab – Monday 12:00-2:15

Meeting Room: A2145

Instructor

Dr. Aaron L. Alford

Office: A2160

Phone: (403) 410-2000, ext. 5940

Email: aalford@ambrose.edu

Textbook (required)

Molles, M. C. and J. F. Cahill. 2011. Ecology: Concepts and Applications, 2nd Canadian Edition. McGraw-Hill Ryerson, Whitby.

Attendance

Regular attendance will be essential for success on all exams and assignments. No points will be subtracted from the grade for non-attendance. However, some assignments cannot be made up if missed.

Course Outline

- I. Unit 1
 - a. Introduction
 - i. What is Ecology?
 - ii. Ecology-Evolution Connections
 - iii. Biomes
 1. Life on Land
 2. Life in Water
 - b. Ecology of Individuals

- i. Temperature Relations
 - ii. Water Relations
 - iii. Energy and Nutrient Relations
- II. Unit 2
 - a. Evolution
 - i. Mechanisms of Evolution
 - ii. Speciation and Species Concepts
 - b. Life History and the Niche Concept
 - c. Ecology of Populations
 - i. Distribution and Abundance
 - ii. Population Structure and Growth
- III. Unit 3
 - a. Ecological Interactions
 - i. Competition
 - ii. Herbivory and Predation
 - iii. Symbioses
 - b. Ecology of Communities
 - i. Abundance and Diversity
 - ii. Succession and Stability
 - iii. Energy and Nutrient Cycling

Expected Learning Outcomes

This class will cover the introductory concepts of ecology and evolution, such as biomes, population dynamics and growth, evolution, and species interactions.

Learning Objectives

1. Students will gain a greater understanding of the evolution principles that shape determine phylogeny and be able to discuss the evolutionary history, biological diversity and modern relationships between species
2. Students will learn and apply the principles of population genetics, natural selection, predation, competition, and those of symbiotic relationships
3. Students will learn the principles of ecology that determine population growth and communities
4. Students will collaborate with peers in a laboratory setting

Course Requirements

Assignments

All exams and assignments are announced and/or scheduled in advance. Assignments are due at the designated time; late work will not be graded.

Lecture

1. Midterm exams are objective, utilizing a variety of formats including multiple-choice, matching, true/false, completion, short answer, and essay questions.
2. Paper assignments will be completed over the course of the semester, and will focus on an area of science, ecology, and/or evolution. Source materials may include scientific journal articles, essays, poetry, or other media. The format of each assignment will vary according to the topic and the course needs. Completing the assignment may involve participation in an open classroom discussion, composing a concise summary, or writing a personal reflection/opinion about the paper. It will be necessary for you to keep these assignments all together in a small composition book or notebook (no loose leaf paper). Notebooks will be collected by the instructor at various times during the semester.
3. The final exam will have a structure similar to the midterm exams, with a combination of question formats. The bulk of the final exam will cover new material, but a proportion of the exam will consist of comprehensive material. Further details regarding this comprehensive material will be forthcoming.

Please note: Students may request revised final exams if they have three exams in one 24-hour period or two exams at the same time. Final exam schedule revision request forms are available at the Registrar's Office and must be handed in by Monday, October 29, 2012 (Fall semester) or Monday, March 4, 2013 (winter semester). If you do not have your request in by this date, all exams within a 24-hour period will have to be written as scheduled. If you have two exams at the same time, you will be given four hours to write both exams. Graded final examinations will be available for supervised review at the request of the student. Please contact your instructor.

Lab (Begins 10 September)

1. Lab Reports are exercises designed to review major concepts, summarize pertinent results, and demonstrate comprehension of material covered during the lab session. Lab reports will always be collected at the beginning of the class in which they are to be submitted, unless otherwise noted by the instructor.

Please note: Attendance at the laboratory sessions is compulsory. Any lab missed without a valid excuse cannot be made up. A valid excuse (such as illness, death in the family etc.) must be validated by written proof from a doctor or counselor. Some lab activities will require field data collection at sites around Ambrose. It is important to be prepared for such activities. Proper preparations include: sturdy

clothing and shoes (long pants, long sleeves, closed-toed shoes), rain gear (jacket and pants), necessary food and water, field notebook (water resistant or place in a ziploc bag), pencil, hat, sunscreen, and insect repellent. Come prepared to work rain or shine, and for the entire lab time. Finally, you **MUST** let the instructor know if you have allergies (food, bee stings, poison ivy, etc.) that will prevent you from participating in labs.

Point Distribution

| Activity | Points | Percent of Grade |
|-------------------|---------------|-------------------------|
| Midterm Exams | 200 | 40% |
| Paper Assignments | 100 | 20% |
| Final Exam | 100 | 20% |
| Lab Reports | 100 | 20% |
| Total | 500 | 100% |

Grading Scale

| | | | |
|----|---------|----|--------|
| A | 93-100% | C | 73-76% |
| A- | 90-93% | C- | 70-73% |
| B+ | 87-89% | D+ | 67-69% |
| B | 83-86% | D | 60-66% |
| B- | 80-83% | F | <60% |
| C+ | 77-79% | | |

Please note: An appeal for change of grade on any course work must be made to the course instructor within one week of receiving notification of the grade. An appeal for change of final grade must be submitted to the Office of the Registrar in writing within 30 days of receiving notification of the final grade, providing the basis for appeal. A review fee of \$50.00 must accompany the appeal to review final grades. If the appeal is sustained, the fee will be refunded.

Important Notes

Electronic Etiquette

Students are expected to treat their instructor, guest speakers, and fellow students with respect. It is disruptive to the learning goals of a course or seminar and disrespectful to fellow students and the instructor to engage in electronically-enabled activities unrelated to the class during a class session. Please **TURN OFF** all cell phones and other electronic devices during class. Laptops should be used for class-related purposes only. Please **DO NOT** use iPods, MP3 players, or headphones. Do not text, read or send personal emails, go on Facebook or other social networks, search the internet, or play computer games during class. The professor has the right to disallow the student to use a laptop in future lectures and/or to ask a student to withdraw from the session if s/he does not comply with this policy. Repeat offenders will be directed to the Dean. If you are expecting

communication due to an emergency, please speak with the professor before the class begins.

Academic Policies

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Student Handbook and Academic Calendar. Personal information, that is information about an individual that may be used to identify that individual, may be collected as a requirement as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at privacy@ambrose.edu.

Extensions

Although extensions to coursework in the semester are at the discretion of the instructor, students may not turn in coursework for evaluation after the last day of the scheduled final examination period unless they have received permission for a “Course Extension” from the Registrar’s Office. Requests for course extensions or alternative examination time must be submitted to the Registrar’s Office by the appropriate deadline (as listed in the Academic Calendar <http://www.ambrose.edu/publications/academiccalendar>). Course extensions are only granted for serious issues that arise “due to circumstances beyond the student’s control.”

Academic Integrity

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Academic dishonesty is taken seriously at Ambrose University College as it undermines our academic standards and affects the integrity of each member of our learning community. Any attempt to obtain credit for academic work through fraudulent, deceptive, or dishonest means is academic dishonesty. Plagiarism involves presenting someone else’s ideas, words, or work as one’s own. Plagiarism is fraud and theft, but plagiarism can also occur by accident when a student fails or forgets to give credit to another person’s ideas or words. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university college. Students are expected to be familiar with the policies in the current Academic Calendar and the Student Handbook that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean and become part of the student’s permanent record.

Students are strongly advised to retain this syllabus for their records!

Lecture Schedule (tentative)

| Month | Week | Date | Lecture Topic | Class Reading | Book Chapter(s) | |
|--------------|-------------|-------------|--------------------------------------|-----------------------------------|------------------------|--|
| Sep | 1 | 3 | | | | |
| | | 4 | | | | |
| | | 5 | Classes Begin | | | |
| | | 6 | Intro to Ecology and Evolution | Text: pp. 4-6; Norris et al. 2005 | 1 | |
| | | 7 | | | | |
| | | | | | | |
| | | | | | | |
| | 2 | 10 | | | | |
| | | 11 | Life on Land | | 2 | |
| | | 12 | | | | |
| | | 13 | Life on Land | | 2 | |
| | | 14 | | | | |
| | 3 | 17 | | | | |
| | | 18 | Life in Water | Paper Assignment Due | 3 | |
| | | 19 | | | | |
| | | 20 | Life in Water | | 3 | |
| | | 21 | | | | |
| | 4 | 24 | | | | |
| | | 25 | Temperature Relations | Text: pp. 80-81; Davis et al 2011 | 5 | |
| | | 26 | Spiritual Emphasis Days (no classes) | | | |
| | | 27 | Spiritual Emphasis Days (no classes) | | | |
| | | 28 | | | | |
| | | | | | | |
| Oct | 5 | 1 | | | | |
| | | 2 | Water Relations | | 6 | |
| | | 3 | | | | |
| | | 4 | Energy and Nutrient Relations | Paper Assignment Due | 7 | |
| | | 5 | | | | |
| | | | | | | |
| | 6 | 8 | Thanksgiving Day (no classes) | | | |

| | | | | | |
|-----|----|----|--|----------------------------------|--------|
| | | 9 | Energy and Nutrient Relations/Midterm Review | Text: pp. 90-92; Moran 1993 | 7 |
| | | 10 | | | |
| | | 11 | Midterm 1 | | |
| | | 12 | | | |
| | | 15 | | | |
| | 7 | 16 | Evolution and Speciation | | 4 |
| | | 17 | | | |
| | | 18 | Evolution and Speciation | Paper Assignment Due | 4 |
| | | 19 | | | |
| | | 22 | | | |
| | 8 | 23 | Life Histories and the Niche | Text: pp. 243-244; Grinnell 1917 | 9 |
| | | 24 | | | |
| | | 25 | Life Histories and the Niche | | 9 |
| | | 26 | | | |
| | | 29 | | | |
| | 9 | 30 | Population Structure and Growth | | 11, 12 |
| | | 31 | | | |
| Nov | | 1 | Population Structure and Growth | Paper Assignment Due | 11, 12 |
| | | 2 | | | |
| | | 5 | | | |
| | 10 | 6 | Competition/Midterm Review | | 13 |
| | | 7 | | | |
| | | 8 | Midterm 2 | | |
| | | 9 | | | |
| | | 12 | Remembrance Day (no classes) | | |
| | 11 | 13 | Herbivory and | Text: pp. 477- | 14 |

| | | | | | |
|-----|----|----|--|---------------------------------------|--------|
| | | | Predation | 478; Widenmaier and Strong 2010 | |
| | | 14 | | | |
| | | 15 | Symbioses | | 15 |
| | | 16 | | | |
| | | | | | |
| | | 19 | | | |
| | | 20 | Symbioses | | 15 |
| | | 21 | | | |
| | 12 | 22 | Abundance and Diversity | Paper Assignment Due | 16, 17 |
| | | 23 | | | |
| | | | | | |
| | | 26 | | | |
| | | 27 | Succession and Stability | | 18 |
| | 13 | 28 | | | |
| | | 29 | Succession and Stability | | 18 |
| | | 30 | | | |
| | | | | | |
| Dec | | 3 | | | |
| | | 4 | Nutrient Cycling/Final Review | | 20 |
| | 14 | 5 | | | |
| | | 6 | Finals week (no class) | | |
| | | 7 | | | |
| | | | | | |
| | | 10 | | | |
| | 15 | 11 | Final Exam: 9:00 am, Room A2133 | | |

Lab Schedule (tentative)

| Month | Week | Date | Lab Topic | |
|-------|------|------|---|--|
| Sep | 1 | 3 | | |
| | | 4 | | |
| | | 5 | | |
| | | 6 | | |
| | | 7 | | |
| | | | | |
| | | | | |
| | 2 | 10 | Biomes - Land (field lab) | |
| | | 11 | | |
| | | 12 | | |
| | | 13 | | |
| | | 14 | | |
| | | | | |
| | 3 | 17 | Biomes - Water (field lab) | |
| | | 18 | | |
| | | 19 | | |
| | | 20 | | |
| | | 21 | | |
| | | | | |
| | 4 | 24 | Lab Report 1/Statistics in Ecology | |
| | | 25 | | |
| | | 26 | | |
| | | 27 | | |
| | | 28 | | |
| | | | | |
| Oct | 5 | 1 | Sampling Populations | |
| | | 2 | | |
| | | 3 | | |
| | | 4 | | |
| | | 5 | | |
| | | | | |
| | 6 | 8 | Thanksgiving Day (no classes) | |
| | | 9 | | |
| | | 10 | | |
| | | 11 | | |
| | | 12 | | |
| | | | | |
| | 7 | 15 | Lab Report 2/Evolution and Natural Selection | |
| | | 16 | | |
| | | 17 | | |
| | | 18 | | |
| | | 19 | | |
| | | | | |

| | | | |
|-----|----|----|--|
| | 8 | 22 | Estimating Population Size |
| | | 23 | |
| | | 24 | |
| | | 25 | |
| | | 26 | |
| | | | |
| | 9 | 29 | Lab Report 3/Population Distribution and Niches |
| | | 30 | |
| | | 31 | |
| Nov | | 1 | |
| | | 2 | |
| | | | |
| | 10 | 5 | Population Growth |
| | | 6 | |
| | | 7 | |
| | | 8 | |
| | | 9 | |
| | | | |
| | 11 | 12 | Remembrance Day (no classes) |
| | | 13 | |
| | | 14 | |
| | | 15 | |
| | | 16 | |
| | | | |
| | 12 | 19 | Lab Report 4/Competition |
| | | 20 | |
| | | 21 | |
| | | 22 | |
| | | 23 | |
| | | | |
| | 13 | 26 | Optimal Foraging |
| | | 27 | |
| | | 28 | |
| | | 29 | |
| | | 30 | |
| | | | |
| Dec | 14 | 3 | Lab Report 5/Predation |
| | | 4 | |
| | | 5 | |
| | | 6 | |
| | | 7 | |
| | | | |
| | 15 | 10 | Finals Week (no lab) |