AMBROSE

BIO 313: ADVANCED ECOLOGY (3)
WINTER 2013

Course Description

Fundamental concepts of ecology and evolution are further explored with regard to population dynamics, predator-prey interactions, and the structure and function of communities.

Further Course Information

Prerequisite: BIO 213 or equivalent

Class Schedule

Meeting Times:

Lecture – Tuesdays and Thursdays 2:30-3:45
Lab – Thursdays 4:00-6:15

Meeting Rooms:

Lecture – A2133
Lab – A2145

Instructor

Dr. Aaron L. Alford
Office: A2160
Office Hours: Tuesdays and Thursdays, 9:00-11:00 or by appointment
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.

Sodhi, N. S., and P. R. Ehrlich (eds.). 2010. Conservation Biology for All. Oxford, New York.*

*Available free of charge at:
www.conbio.org/images/content_publications/ConservationBiologyforAll_reducedsize.pdf

Other Materials

We will be doing a number of computations for which a scientific calculator will be helpful. In addition, most of our lab activities will involve the electronic presentation of data and results. Students are encouraged to bring scientific calculators and laptops to lab. Also, please find below software programs that will be helpful for completing the lab activities.

Microsoft Excel (must have Analysis Toolpak add-in)
Microsoft Word
Adobe Reader: http://get.adobe.com/reader/
Google Earth: http://www.google.com/earth/index.html
Dropbox (I will send an invite via email): http://www.dropbox.com

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 Context
   a. Introduction
      i. Ecology and Conservation Biology
      ii. Ecology and Evolution
      iii. Thinking Quantitatively
   b. The Ecological Community
      i. Organism Abundance and Distribution
      ii. Patterns of Diversity
      iii. Species Interactions

II. Unit 2 – Flows and Changes
   a. Ecological Succession
      i. Two Paradigms
      ii. Ecology and Scale
   b. Disturbances
      i. Equilibrium/Non-equilibrium
   c. Ecosystem Stability
   d. Food Webs
      i. Primary and Secondary Production
      ii. Trophic Interactions
   e. Biogeochemical Cycling
      i. Pools and Reservoirs
      ii. Phosphorous, Nitrogen, and Carbon

III. Unit 3 – Ecology and Conservation
   a. Local Patterns

i. Ecology of Alberta
ii. Contemporary Issues

b. Global Patterns
i. Macroecology
ii. Climate Change

c. Sustainability and Creation Care

Expected Learning Outcomes

This class will cover advanced concepts of ecology and conservation.

Learning Objectives

1. Students will further examine the interdependence of ecology and evolution, and the context it provides for understanding the structure and function of communities.
2. Students will explore the fundamental characteristics of ecological communities: abundance, distribution, and diversity.
3. Students will understand the flow of energy and nutrients through ecological systems, and its corresponding effect at different temporal and spatial scales.
4. Students will become familiar with local and global issues of ecological concern, and discuss perspectives on environmental stewardship and conservation.
5. Students will build quantitative, analytical, and written communication skills in collaboration with peers in a laboratory setting.

Course Requirements

Assignments

All exams and assignments are announced and/or scheduled in advance, and will occur as scheduled, unless otherwise noted. All assignments will be due at the designated time; late work CANNOT be graded without a legitimate, documented excuse.

Lecture

1. Written exams are objective, utilizing a variety of formats including multiple-choice, matching, true/false, fill in the blank, short-answer, and long-answer questions.

2. A series of topical readings will be completed over the course of the semester, and will supplement lecture and lab activities. Source materials may include scientific journal articles, essays, poetry, or other media. Reading assignments will involve both written work and active participation in classroom discussion.

3. The final exam will have a structure similar to that of the other exams (see above). Although the bulk of the final exam will cover new material, approximately 10% of the exam will be comprehensive in nature.

   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 January)

1. Lab Reports are 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 field sites near 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), pencils, 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**
Lecture Exams (including Final)	300	60%
Lab Reports	100	20%
Reading Assignments	50	10%
In-Class Activities	50	10%
Total	500	100%

Grading Scale

A+	97-100%		C+	67-69%	
A	93-96%	Excellent	C	63-66%	Satisfactory
A-	89-93%		C-	60-62%	
B+	83-89%		D+	54-59%	
B	77-82%	Good	D	50-53%	Minimal Pass
B-	70-76%		F	Below 50%	Fail

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, any guests, 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 yo u 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 Readings	Book Chapter(s)
Jan	1	7			
		8			
		9	Classes Begin		
		10	Introduction/Ecology and Conservation Biology		16 (MC); 1 (SE)
		11			
	2	14			
		15	Ecology and Evolution	Reading 1	4 (MC)
		16			

		17	Abundance and Diversity		16 (MC); 2 (SE)
		18			
		21			
		22	Abundance and Diversity	**Reading 1 Due**	16 (MC); 2 (SE)
	3	23			
		24	Abundance and Diversity		16 (MC); 2 (SE)
		25			
		28			
		29	Species Interactions	Reading 2	17 (MC)
	4	30			
		31	Community Day (no classes)		
Feb		1			
		4			
		5	Species Interactions/Midterm Review	**Reading 2 Due**	17 (MC)
	5	6			
		7	**Exam 1**		
		8			
		11			
		12	Succession and Stability	Reading 3	18 (MC); 5 (SE)
	6	13			
		14	Succession and Stability		18 (MC); 5 (SE)
		15			
		18	Family Day (no classes)		
	7	19	Mid-semester break (no classes)		

		20	Mid-semester break (no classes)		
		21	Mid-semester break (no classes)		
		22	Mid-semester break (no classes)		
		25			
		26	Succession and Stability	**Reading 3 Due**	18 (MC); 5 (SE)
	8	27	Global Impact Community Day (no day classes)		
		28	Production and Energy Flow		19 (MC)
Mar		1			
		4			
		5	Production and Energy Flow	Reading 4	19 (MC)
	9	6			
		7	Nutrient Cycling and Retention		20 (MC); 3 (SE)
		8			
		11			
	10	12	Nutrient Cycling and Retention/Midterm Review	**Reading 4 Due**	20 (MC); 3 (SE)
		13			
		14	**Exam 2**		
		15			
		18			
	11	19	Landscape Ecology/Alberta Ecological Issues	Reading 5	21 (MC)
		20			

		21	Landscape Ecology/Alberta Ecological Issues		21 (MC)
		22			
		25			
		26	Macroecology		22 (MC); 8 (SE)
	12	27			
		28	Macroecology	**Reading 5 Due**	22 (MC); 8 (SE)
		29	Good Friday (no classes)		
Apr		1			
		2	Global Ecology		23 (MC); 15 (SE)
	13	3			
		4	Global Ecology		23 (MC); 15 (SE)
		5			
		8			
		9	Course Review		
		10			
	14	11	**Final Exam: 9:00am, Room A2133**		
		12			

Lab Schedule (tentative)

Month	**Week**	**Date**	**Lab Topic**
Jan		7	
		8	
		9	Classes Begin
	1	10	Using Excel/Statistics in Ecology
		11	

	2	14	
		15	
		16	
		17	The Community Concept
		18	
	3	21	
		22	
		23	
		24	**Lab Report 1 Due**, Measuring Diversity I
		25	
	4	28	
		29	
		30	
		31	Community Day (no classes)
Feb		1	
	5	4	
		5	
		6	
		7	Measuring Diversity II
		8	
	6	11	
		12	
		13	
		14	**Lab Report 2 Due**, Succession I
		15	

	7	18	Family Day (no classes)
		19	Mid-semester break (no classes)
		20	Mid-semester break (no classes)
		21	Mid-semester break (no classes)
		22	Mid-semester break (no classes)
	8	25	
		26	
		27	Global Impact Community Day (no day classes)
		28	Succession II
Mar		1	
	9	4	
		5	
		6	
		7	**Lab Report 3 Due**, Energy Flow
		8	
	10	11	
		12	
		13	
		14	Nutrient Cycling
		15	
	11	18	

		19	
		20	
		21	**Lab Report 4 Due,** Landscape Ecology
		22	
	12	25	
		26	
		27	
		28	Ecological Modelling
		29	
Apr	13	1	
		2	
		3	
		4	**Lab Report 5 Due**, TBA
		5	
	14	8	
		9	
		10	
		11	
		12	