

2017 Syllabus for Biology 221: Ecology

Tuesday/Thursday 8:00am–9:40am

132 Integrated Science Center

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Office Hours: MWF (see course schedule) or by appointment

The schedules and policies associated with this course may be subject to revision or change as a consequence of changing circumstances or events. Reasonable notification will be provided to students prior to any major changes in course policies or procedures.

Course Description

Covers the basic principles of energy and nutrient movement through the ecosystems, the forces that structure ecosystems, and the interactions between organisms and the environment and each other. This course emphasizes quantitative skills. Two lectures and four hours of laboratory per week.

Course Goals

The primary objective of this course is to provide a basis for your understanding of ecology, which includes the complex interactions between organisms and their environment. You will learn to draw together elements from biology, chemistry, physics, geology, and mathematics to gain a greater understanding of ecological relationships in the natural world. The goals of the course are to:

1. Discuss classical and current ecological issues and methodology
2. Address natural diversity and how humans interact with the environment
3. Examine biodiversity and sustainability of natural systems
4. Explore the benefits and limitations of scientific efforts to understand ecological relationships
5. Critically evaluate environmental issues locally, regionally, and globally
6. Practice communicating your ecological and scientific knowledge in meaningful and effective ways

Learning Outcomes

1. Access, critically evaluate, and correctly use scientific literature
2. Classify organizational levels observed in ecology
3. Explain how populations are regulated and how data can be collected, analyzed, and interpreted using statistics, life tables, graphs, and survivorship curves
4. Describe the interactions between different species and how they impact one another
5. Illustrate the major forces responsible for community structure, how community structure can be represented by food webs, and how communities change in both space and time
6. Discuss patterns and measurements of biodiversity and predict the consequences of continued species loss
7. Communicate your interpretations, questions, and critiques of the readings with your colleagues during Moodle group discussions

Required Textbooks

- SimUText Ecology
- Carrol, S.B. 2016. *The Serengeti Rules*. Princeton University Press, Princeton. 263pp.
- Pollan, M. 2006 *The Omnivore's Dilemma*. Penguin Press, New York. 451pp.
- Leopold, A. 1987. *A Sand County Almanac and Sketches Here and There*. Oxford University Press, New York. 228pp.
- McMillan, V.E. 2012. *Writing Papers in the Biological Sciences*. 5th ed. New York: Bedford/St. Martin's

Attendance Policy

Regular attendance and participation in class is critical to your success at Concordia College. Because any absence, excused or unexcused, detracts from the learning experience, you are expected to attend all classes. Dr. ArchMiller also values the educational experience afforded by student participation in co-curricular activities; however, you are responsible for notifying Dr. ArchMiller of scheduled absences (e.g., co-curricular activities) at the beginning of the semester, or as soon as that information is available (but no less than 24 hours in advance).

If absences become what Dr. ArchMiller determines to be excessive (from 10-15% of classes, without valid college-recognized excuses), points will be deducted from your final percentage. In extreme cases (> 20% of classes or 6 unexcused absences), Dr. ArchMiller will assign a failing grade. **I strongly recommend that you are present and participate in the class.**

PARTICIPATION in class and lab will not go towards your grade directly. However, a record throughout the semester of exemplary participation and attendance can help in the case of a borderline final grade. Active participation also nurtures learning, and will improve the quality of future recommendation letters from your instructors.

Accommodations for Students with Disabilities

In accordance with the Americans with Disabilities Act, Concordia College and your instructor are committed to making reasonable accommodations to assist individuals with documented disabilities to reach their academic potential. Such disabilities include, but are not limited to, learning or psychological disabilities, or impairments to health, hearing, sight, or mobility. If you believe you require accommodations for a disability that may impact your performance in this course, you must schedule an appointment with Disability Services to determine eligibility. Students are then responsible for giving instructors a letter from Disability Services indicating the type of accommodation to be provided; please note that accommodations will not be retroactive. The Disability Services office is in Academy 106, phone 218-299-3514; <https://www.concordiacollege.edu/directories/offices-services/counseling-center-and-disabilityservices/disability/>

Respect for Diversity

It is my intent that students from diverse backgrounds and perspectives be well-served by this course, and that the diversity that students bring to this class be viewed as a resource. Please let me know ways to improve the effectiveness of the course for you, personally, or for other students or student groups. As a

student in this class, you are required to treat other members of the class with respect and kindness. Disrespectful, rude, or exclusive behavior will not be tolerated.

Grades

Category	Item	Details	%
SimUText Readings			
	Reading Completion	Pass/Fail for each assignment	5
	Graded Questions	2 lowest scores dropped	5
Exams & Quizzes			
	Quizzes	2 lowest scores dropped*	10
	Exam 1	Oct. 5; Unit 1 material	10
	Exam 2	Nov. 9; Unit 2 material	10
	Final Exam	Dec. 13; 66% Unit 3; 34% Units 1&2	15
Discussions & Paper			
	Group Discussions	Participate through Moodle	10
	Symposium Paper	Due Sept. 28	5
Laboratory			30
			Total 100

SIMUTEXT READINGS are from the interactive textbook for this class, and each module has integrated, feedback-focused questions followed by a series of graded questions.

Reading Completion will be evaluated with the feedback-focused, ungraded questions and will be assessed with a pass-fail grade (completed or not) for each SimUText assignment. The **Graded Questions** will be worth another 5% of your final grade; however, the two lowest scores will be dropped before final grades are completed.

While the reading completion and graded questions for each SimUText Unit are not officially due until the Monday night before that Unit's exam (see schedule), I will give daily quizzes on the SimUText Material. Thus, I **strongly** encourage that you complete the SimUText reading and graded questions as we move through the material, rather than waiting for the due date. (Although, it may help to complete the graded questions after the material has been covered in lecture.) You may work through the SimUText material with your peers; however, mastering the material is your individual responsibility.

Percentage	Grade
≥ 94	A
90-93.9	A-
87-89.9	B+
83-86.9	B
80-82.9	B-
77-79.9	C+
73-76.9	C
70-72.9	C-
67-69.9	D+
60-66.9	D
< 60	F

EXAMS AND QUIZZES

Quizzes are designed to quickly check for reading and comprehension of that lecture date's SimUText material and record attendance. Quizzes will be short (2 or 3 questions) and given at the beginning of class time on most days.

I expect you to come to class having read through the SimUText material, but I also understand that this is not your only class. Thus, I will drop the two lowest quiz scores.

*In addition, I will make homework available for students that have excused absences. If you have an excused absence (thus a 0 for that quiz), you may—up to 3 times over the course of the semester—complete homework to replace a zero quiz score. The homework assignments will be designed to give you more hands-on practice with quantitative topics covered in lecture and in the SimUText readings; however, they will be more difficult than quizzes.

Lecture Exams will be of variable format, including—but not limited to—multiple choice, true/false, matching, short answer, and brief essays. All exams will be somewhat cumulative but will primarily focus on the associated SimUText Unit material (see table above); in addition, the final exam will be one-third cumulative.

DISCUSSIONS AND PAPER

Group Discussions allow you to work as a team of scientists with your colleagues to critically discuss three separate books, *The Serengeti Rules*, *The Omnivore's Dilemma*, and *A Sand County Almanac*. Group discussions will occur in forum format on Moodle. Groups will be assigned at random and will be reassigned for each new book (i.e., by October 16 and November 20). You will be graded based on the quantity, quality and timing of your comments (see grading rubric below). Each discussion is worth a total of 5 points.

The group as a whole is responsible for completing the assignment; in this case providing a good discussion and coming to a better understanding of ecology and evolution. Everyone should contribute to the discussion, and you are expected to provide at least two comments; ideally one will be an original question or discussion point, and one will be a reply to another group member's comment. You should take this opportunity to learn from and respectfully teach each other.

Grading Criteria	Exemplary	Adequate	Poor
Quantity of Comments	>2 Comments (2pts)	2 Comments (1.5pts)	1 Comment (1pt)
Quality of Comments	Focused on ecological aspects and tackled central themes of reading (2pts)	Indicated a superficial understanding of reading or focused on details w/o conveying importance to ecology or main themes of text (1.5pts)	Conveyed little understanding of reading; not relevant to ecology or main themes of text (1pt)
Timing of 1 st Comment	>48 hrs before noon (1pt)	24–48 hrs before noon (0.5pt)	<24 hrs before noon (0pts)

The Symposium Paper is a 3-page, 1.5-spaced paper with 12-point font, that is due at 11:59pm on Thursday, September 28 (upload on Moodle). The 2017 Faith, Reason & World Affairs Symposium—Reformation: Transforming the World One Door at a Time takes place on September 19–20, and you are required to attend **one** of the following concurrent sessions (taking place Wednesday afternoon):

- Planetary Solidarity: Faith, Climate and Gender Justice in Global Perspective
- The Effects of Humans, Climate Change, and Pollution on the Everglades and Other National Parks
- The Thaw
- Transforming Anderson Commons One Plate at a Time

The Symposium Paper should name and summarize the session you attended, including two questions/answers raised during the Q/A of the session, and your reaction. At least one page of your paper should explore how the symposia relate to ecology, the environment and/or campus life. You will be graded out of 100 points based on the following (a detailed rubric is provided on Moodle):

- Spelling and grammar (10pts)
- Summary of session and one Q/A (40pts)
- Relation of session topic to ecology and the environment (30pts)
- Relation of session topic to campus life and/or Fargo-Moorhead region (20pts)

Biology Department Policy on Use of Electronic Devices

1. All electronic devices (including cellular phones) must be set to silent during scheduled lecture and laboratory sessions.
2. No electronic devices (laptop computers, PDA, cell phones, MP3 players, digital cameras, etc) should be brought into the classroom during exams, with the exception of materials needed for the exam (e.g., a calculator is permitted if mathematical analysis is required).
3. If you wish to use a calculator during an exam, it must be a simple calculator that is non-programmable and non-text-storing. Examples include Aurora HC 108X and HC 206, available at the bookstore.
4. Sharing of calculators on exams is not permitted.

Although it has been proven in many studies that taking notes by hand on paper is the most effective for learning, I am not opposed to using laptops to take notes in class. However, the inappropriate use of laptops can be distracting to students and is viewed as a serious disruption of the learning environment. I reserve the right to check laptops at any time and to ask you to put them away or leave if I see you using them inappropriately. **Please be respectful and turn your cell phones off during class.**

Academic Integrity (from Student Handbook)

“Students are responsible for maintaining and encouraging academic integrity at the college. We expect all students to act with integrity in the classroom and in completing and submitting assignments. Ultimately, students bear the responsibility of ensuring the integrity of their own work. Students are expected to meet at least the minimal requirements of each course with work of appropriate quality.

“At no time is cheating on examinations, quizzes, or assignments acceptable at Concordia. Students are also expected to exercise appropriate caution to avoid plagiarism on written assignments.”

I will not tolerate any instance of academic dishonesty, including cheating, plagiarism, falsification, facilitating others' violations, or impeding (see student handbook for definitions).

Instances of academic dishonesty will result in either a failing grade for that activity or for the course, according to the perceived intent and extent of the instance(s) of academic dishonesty. All academic integrity violations will be reported to the Office of Academic Affairs.

Course Schedule (version dated 8/28/2017)

- SimUText Sections: You are expected to come to class prepared by reading that lecture's associated SimUText Module. There will be quizzes on reading material at the beginning of lecture.
- GD: Group discussions on Moodle. You will be graded based on your participation and are expected to post to each discussion section at least twice by noon the day each discussion unit is due.
- OH: Dr. ArchMiller's office hours, ISC 222 (MWF, but at varying times; see schedule for details)

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Aug 28th	29th	30th	31st First Day of Class <i>SimUText Unit 1: Understanding Experimental Design 1-2</i>	Sep 1st OH: 8am-9am
4th OH: 3pm-4pm	5th <i>SimUText Unit 1: Evolution for Ecology 1-2</i>	6th OH: 11am-12pm	7th <i>SimUText Unit 1: Evolution for Ecology 3-4</i>	8th OH: 8am-9am
11th GD: The Serengeti Rules p1-46 (by noon) OH: 3pm-4pm	12th <i>SimUText Unit 1: Biogeography 3-4</i>	13th OH: 11am-12pm	14th <i>SimUText Unit 1: Physiological Ecology 1-2</i>	15th OH: 8am-9am
18th GD: The Serengeti Rules p47-105 (by noon) OH: 3pm-4pm	19th <i>SimUText Unit 1: Physiological Ecology 3-4</i>	20th Symposium No office hours	21st <i>SimUText Unit 1: Ecosystem Ecology 1-2</i>	22nd OH: 8am-9am
25th Dr. ArchMiller at TWS GD: The Serengeti Rules p107-168 (by noon) No office hours	26th Dr. ArchMiller at TWS Library Materials Lecture in Library Lab Classroom	27th Dr. ArchMiller at TWS No office hours	28th Symposium Paper due 11:59pm <i>SimUText Unit 1: Ecosystem Ecology 3-4</i>	29th OH: 8am-9am

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
<div>Oct 2nd</div> SimUText Unit 1 due by 11:59pm OH: 2:30pm-4pm	3rd <i>SimUText Unit 2: Climate Change 1-3</i>	4th OH: 11am-12pm	5th EXAM 1	6th OH: 8am-9am
9th GD: The Serengeti Rules p169–214 (by noon) OH: 3pm-4pm	10th <i>SimUText Unit 2: Climate Change 4-5, Nutrient Cycling 1</i>	11th OH: 11am-12pm	12th <i>SimUText Unit 2: Nutrient Cycling 2-4</i>	13th OH: 8am-9am
16th GD: Omnivore's Dilemma p1–56 (by noon) OH: 3pm-4pm	17th <i>SimUText Unit 2: Life History 1-2</i> March Book 3 Presentation 9:20am–10:20am	18th OH: 11am-12pm	19th <i>SimUText Unit 2: Life History 3-4</i>	20th OH: 8am-9am
23rd Mid Semester Break—No Class	24th Mid Semester Break—No Class	25th GD: Omnivore's Dilemma p65–99 (by noon) OH: 11am-12pm	26th <i>SimUText Unit 2: Population Growth 1</i>	27th OH: 8am-9am
30th GD: Omnivore's Dilemma pp 123-140; 158–162; 169–173; 364–390 (by noon) OH: 3pm-4pm	31st <i>SimUText Unit 2: Population Growth 2-3</i>	<div>Nov 1st</div> OH: 11am-12pm	2nd <i>SimUText Unit 2: Population Growth 4-5</i>	3rd OH: 8am-9am
6th SimUText Unit 2 due by 11:59pm OH: 2:30pm-4pm	7th <i>SimUText Unit 3: Competition 1-2</i>	8th OH: 11am-12pm	9th EXAM 2	10th OH: 8am-9am
13th GD: Omnivore's Dilemma pp 185–225; 262–273; 410-441 (by noon) OH: 3pm-4pm	14th <i>SimUText Unit 3: Competition 3-4</i>	15th OH: 11am-12pm	16th <i>SimUText Unit 3: Predation, Herbivory, Parasitism 1-2</i>	17th OH: 8am-9am

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
20th GD: Sand County Almanac pp vii–52 (by noon) OH: 3pm–4pm	21st <i>SimUText Unit 3: Predation, Herbivory, Parasitism 3-4</i>	22nd OH: 11am–12pm	23rd Thanksgiving Break–No Class	24th Thanksgiving Break–No Class No office hours
27th GD: Sand County Almanac pp 53–92 (by noon) OH: 3pm–4pm	28th <i>SimUText Unit 3: Predation 5; Community Dynamics 1</i>	29th OH: 11am–12pm	30th <i>SimUText Unit 3: Community Dynamics 2-3</i>	Dec 1st OH: 8am–9am
4th GD: Sand County Almanac pp 95–112; 129–137; 165–176 (by noon) OH: 3pm–4pm	5th <i>SimUText Unit 3: Community Dynamics 4-5</i>	6th OH: 11am–12pm	7th <i>SimUText Unit 3: Biogeography 1-2</i>	8th OH: 8am–9am
11th GD: Sand County Almanac pp 188–226 (by noon) SimUText Unit 3 due by 11:59pm OH: 3pm–5pm	12th Last Class - Review	13th OH: 11am–12pm FINAL EXAM 2pm–4pm	14th OH: 8am–11am	15th OH: 8am–9am

Syllabus Acknowledgement

I, _____, have received a copy of the syllabus for BIOL 221, Ecology, and understand all of the policies and procedures outlined herein.

SIGNATURE _____ Date _____

Use of Photographic Likeness Release

For good and valuable consideration, I authorize Dr. ArchMiller to record photographs of me and use, reproduce, modify, distribute, and exhibit such photographs, in whole or in part, without restrictions or limitation for marketing and instructional purposes.

I release Dr. ArchMiller, Concordia College, its successors and assigns, agents, and all persons for whom it is acting from any liability by virtue of any blurring, distortion, alteration, optical illusion, or use in composite form, whether intentional or otherwise, that may occur or be produced in the photographic process and waive any right that I may have to inspect or approve the finished recordings.

PRINTED NAME _____

SIGNATURE _____ Date _____

Optional Information

PREFERRED NAME OR NICKNAME _____

MAJOR _____

CONTACT PHONE NUMBER _____

WHERE'S "HOME?" _____

WAYS YOU ARE SIMILAR TO OTHER COBBERS _____

WAYS YOU ARE UNIQUE COMPARED TO OTHER COBBERS _____

