

ECOLOGY & SOCIETY (EEB 306)

Spring Semester 2017

When and Where:	3:40-4:55 PM TTh	575 Dabney-Buehler
Instructor:	A. C. Echternacht 974-3065 or 974-2256	530 Hesler Biology Building echterna@utk.edu
Required Texts:	Fishman, Charles. 2011. The Big Thirst: The Secret Life and Turbulent Future of Water. Free Press, New York.	
	Kolbert, Elizabeth. 2015a. Field Notes from a Catastrophe – Man, Nature, and Climate Change, Updated Edition. Bloomsbury USA, New York.	
	Kolbert, Elizabeth. 2015b. The Sixth Extinction – An Unnatural History, Reprint Edition. Picador, New York.	
	Quammen, David. 2014. Ebola – The Natural and Human History of a Deadly Virus. W.W. Norton & Company, New York.	

RATIONALE FOR THIS COURSE

The intent of this course is to introduce basic concepts in ecology that pertain to the health and welfare of the biosphere and its inhabitants, including humans. All of the topics covered involve issues that are frequently discussed in the print and electronic media, and many involve governmental regulation. Although it is probable that few, if any, of you aspire to a career requiring expertise in ecology, all of you will have the opportunity, if only by exercising your right to vote, of becoming involved in decisions that relate directly or indirectly to critical environmental issues. So ... the purpose of this course is to help you become an “educated Layman” when it comes to environmental issues by giving you a better understanding of these issues and the science upon which intelligent decisions should be based.

SCHEDULE

Overview of the Course

12 January	Th	Overview
17	T	Overview, continued

Biodiversity, Endangered Species and Introduced Species

Required Reading: Kolbert 2015b

19	Th	Biodiversity, Species Diversity, and Species Richness
24	T	Large-scale patterns of Species Richness
26	Th	Major threats to biodiversity and species richness

31 January	T	An underappreciated threat: introduced species – case studies
2 February	Th	case studies, continued
7	T	Why should we be concerned; Ecosystem Services
9	Th	Examination No. 1: Covers 17 January – 7 February

Global Climate Change and the Water Crisis

Required Reading: Fishman 2011 (part), Kolbert 2015a

14	T	Present climate and global patterns
16	Th	Past climate and what it can tell us about the future Deadline for approval of 1st paper title/topic
21	T	The global water crisis: taking a necessity for granted
23	Th	What we can do about it ...
28	T	and what we can't.
2 March	Th	The future in now! And it's not looking all that great.
7	T	Examination No. 2: Covers 14 February – 2 March

Emerging Infectious Diseases (EID's)

Required Reading: Quammen 2014

9	Th	NOVA video: <i>Ebola</i>
10	F	1st paper due by midnight
14-16	T & Th	Spring Break
21	T	What are infectious diseases and what are <i>emerging</i> infectious diseases?
23	Th	Examples of important infectious diseases: case studies Deadline for approval of 2nd paper title/topic
28	T	Consequences even when mortality rates are low
30	Th	Control of infectious diseases
4 April	T	Links between EID's, climate change, and biodiversity
6	Th	Examination No. 3: Covers 9 March – 4 April

Populations

No text

11	T	Emergent characteristics of populations
13	Th	Population growth
18	T	Population regulation
20	Th	Population Regulation, continued; 2nd paper due by midnight
25	T	Human population growth through the ages
27	Th	Human population regulation: is it possible? If not, why not?
9 May	T	Examination No. 4: Covers 11 - 27 April (administered 12:30-2:30 in 575 Dabney)

Course Format: Each module of the course will consist of lectures and discussion of basic ecological concepts and implications for humans. The lectures and discussion will be supported by readings from the course texts and/or material distributed in class. For each module a glossary of terms will be provided.

Examinations: The examinations will cover only material indicated by the dates that appear in the schedule and will be largely short-answer essay in nature. Examination 1 will be worth a maximum of 25 points, and

Examinations 2 - 4 will each be worth a maximum of 50 points. Copies of past examinations will not be distributed, but a study guide (review questions) will be distributed prior to each exam.

How to Study for Examinations: Each module of the course covers about 3½ weeks. For the modules for which a book has been assigned, read the book or the specified part of that book over that period. DO NOT attempt to read an entire book a few days before the exam. Read any additional material soon after it has been distributed in class. Answer all of the questions on the set of review questions that will be distributed prior to each exam. This is best done in groups of no more than 3-4 students who meet to discuss each question in an unoccupied classroom or other location where you will not be disturbed and which has a white board. Do not attempt to study at The Long Branch Saloon or any similar establishment. Nothing you learn there will be on any of the exams.

Papers: Two short papers are required in this course. You may choose topics related to any of those discussed in the course **but your topic must be approved by the instructor by the deadline (see syllabus above)**. The papers must be no less than five pages and no more than seven pages in length (not counting literature citations, and any figures and/or tables), and must be typed, double spaced, and in 11 or 12-point font. **A minimum of six sources must be cited, and no more than 1/3 of sources can be internet sources.** One copy of each paper must be sent to the instructor on or before the due date, **as an email attachment in Word**. Formatting guidelines will be distributed in class. Each paper will account for a maximum of 25 points in the calculation of your final grade.

Take-home Exercises: There will be a web-based take-home exercise associated with each of the four modules. These exercises will be due at the time announced in class. Each exercise should take no more than 30 - 45 minutes to complete and each will account for 5 points toward the final grade (total of 20 points). Because the exercises will be the basis for discussion on the day following the day they are due, **no late exercises will be accepted.**

Attendance: At the end of each class except the first and days on which an exam is scheduled, you will turn in a form that asks a) what you found new and/or most interesting about the lecture or discussion, and b) is there anything you did not understand. The latter will usually be addressed in the next class. (24 possible points)

Grades and Grading: The total number of points possible will be 175 (exams) + 50 (term papers) + 20 (take-home exercises) + 24 (attendance) = 269. Your grade will be based on the per cent of total points earned out of the 269 possible: A = 93-100%, A- = 90-92%, B+ 87-89%, B = 83-86%, B- = 80-82%, C+ = 77-79%, C = 73-76%, C- = 70-72%, D+ = 67-69%, D = 63-66%, D- = 60-62%, F = 59% or below.

Office Hours: Dr. Echternacht does not have regularly scheduled office hours. Dr. Echternacht will, however, schedule meetings by appointment at a time convenient to the student. To arrange an appointment, see him in class or contact him by email (echterna@utk.edu).

Communication: Check your email and Blackboard regularly for messages concerning take-home exercises, exams, and other information from Dr. Echternacht. The course syllabus, take-home exercises, terminology sheets, and exam review questions will be posted on Blackboard.

Disabilities: If you need course adaptations or accommodations because of a documented disability, or if you have emergency information to share, please contact the Office of Disability Services. This will ensure that you are properly registered for services. Campus location: 100 Dunford Hall. Phone: (865) 974-6087. VP: (865) 622-6566. E-mail: ods@utk.edu.

Academic Integrity: Your continued participation in this class assumes that you abide by the University of Tennessee Honor Code (Undergraduate Catalog 2015-2016): "An essential feature of the University of Tennessee, Knoxville, is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal; commitment to honor and integrity."

The following pertains only to Biology majors in the College of Arts & Sciences. Ecology & Society (EEB 306) is part of the Connections Package “Biodiversity and Humans” in the College of Arts & Sciences Curriculum. See the *Rationale for this Course* on page 1 of this syllabus to see how this course relates to this Connections Package.

In addition, students seeking a degree in Biological Sciences (whether the concentration is in Biochemistry, Cellular, & Molecular Biology, Ecology & Evolutionary Biology, or Microbiology) are expected to be able to do the following* by the time they graduate. Ecology & Society is intended to contribute to your understanding of all of the following, though not equally. Those especially relevant to the course are indicated by an asterisk (*).

1. Explain and provide examples of each of the five big ideas in Biology, using their knowledge of biological concepts gained from their course of study:
 - a. **Evolution***: Populations of organisms and their cellular components have changed over time through both selective and non-selective evolutionary processes.
 - b. **Structure and Function***: All living systems (organisms, ecosystems, etc.) are made of structural components whose arrangement determines the function of the systems.
 - c. **Information Flow and Storage**: Information (DNA, for example) and signals are used and exchanged within and among organisms to direct their functioning.
 - d. **Transformations of Energy and Matter***: All living things acquire, use, and release and cycle matter and energy for cellular/organismal functioning.
 - e. **Systems***. Living systems are interconnected, and they interact and influence each other on multiple levels.

These biological concepts are more fully explained in the American Association for the Advancement of Science (AAAS)/National Science Foundation (NSF) report “Vision and Change in Undergraduate Biology Education” (visionandchange.org).

2. Demonstrate the ability to perform the following scientific practices:
 - a. **Formulate** empirically-testable hypotheses
 - b. **Interpret*** visual representations (figures and diagrams)
 - c. **Evaluate** data and come to a conclusion (with evidence)(formulate a argument)*

Student ability to achieve these learning objectives will be tested periodically as part of the student’s departmental requirements.