

ECOLOGY & SOCIETY (EEB 306)
Fall Semester 2015

When and Where: 3:40-4:55 PM TTh 575 Dabney-Buehler

Instructor: A. C. Echternacht 530 Hesler Biology Building
974-3065 or 974-2256 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. 2015. Field Notes from a Catastrophe – Man, Nature, and Climate Change, Updated Edition. Bloomsbury USA, New York.

Kolbert, Elizabeth. 2015. 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

Biogeochemical Cycles, Energy Flow and Water
Required Reading: Fishman 2011 (Assigned Pages)

20 August	Th	Introduction
25	T	Biogeochemical Cycles
27	Th	Energy Flow in Ecosystems
1	T	Biologically Important Characteristics of Water
3	Th	The Global Water Crisis
8	T	The Global Water Crisis, continue
10	Th	<i>Examination No. 1: Covers 20 August – 8 September -</i>

Global Climate Change

Required Reading: Kolbert 2015 – Field Notes from a Catastrophe

15	T	Global Climate, Past and Present
17	Th	Empirical Evidence of Change
22	T	Causes of Change
24	Th	Consequences of Change

Deadline for approval of 1st paper title/topic

Biodiversity and Invasive Species

Required Reading: Kolbert 2015 – The Sixth Extinction

29	T	Ecological Communities: Species Interactions
1 October	Th	Ecosystem Services
6	T	Threats to Biodiversity
8	Th	Invasive Species
13	T	Invasive Species, continued
15	Th	Fall Break: No Class
20	T	<i>Examination No. 2: Covers 15 September – 13 October</i>

Emerging Infectious Diseases (EID's)

Required Reading: Quammen 2014

22	Th	Video: Ebola – The Plague Fighters (NOVA), <i>1st paper due</i>
27	T	What are EID's
29	Th	EID's of Particular Importance to Humans
3 November	T	Links Between EID's and Climate Change
5	Th	Links Between EID's and Biodiversity

Deadline for approval of 2nd paper title/topic

Populations

No Text

10	T	Characteristics of Populations
12	Th	Population Growth and Regulation
17	T	Human Population Growth
19	Th	Consequences of Human Overpopulation
24	T	Consequences of Human Overpopulation, continued; <i>2nd paper due</i>
26	Th	Thanksgiving: No Class
9 December	W	<i>Examination No. 3: Covers 22 October – 24 November (5:00-7:00 in 575 Dabney)</i>

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 and 3 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 2 ½ 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 (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 these may be internet sources.** One copy of each paper must be presented 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 five modules. These exercises will be due at the time announced in class. Each exercise should take no more than 30 minutes to complete and each will account for 5 points toward the final grade (total of 25 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) what questions, if any, you have about the material presented. It's assumed that everyone will have to miss at least one class session (so few, if any, will receive full points for attendance = 25).

Discussion: After the last class session, you will be assigned a numerical grade for your participation in discussions. Possible points are 0, 6, 12, 18 and 24. This is obviously subjective, but it is definitely worth getting involved in the discussions since 24 points is ~10% of your grade. Being "shy" is not an excuse, nor is the fact that you may have no background in biology other than a year of general biology. You will have an opinion, and this is your opportunity to express it. Do not be intimidated by those in the class who have a more extensive background in biology than you. Those who have little background in biology, and those who have more, often bring different, and valuable, perspectives to the discussions.

Grades and Grading: The total number of points possible will be 125 (exams) + 50 (term papers) + 25 (take-home exercises) + 25 (attendance) + 24 (discussion participation) = 249. Course grades will depend on the class distribution of total points, except that if your total points amount to 233 (~93%) or above of the total possible of 250, you are guaranteed a grade of A, and if your total points are 125 (~50%) or below, you are guaranteed an F.

Office Hours: The instructor 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 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 1d, 1e, and 2 below:

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.