ECOLOGY & SOCIETY (EEB 306)

Spring Semester 2015

When and Where:	3:40-4:55 PM TTh	575 Dabney Biology Building
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. 2006. Field Notes from a Catastrophe: Man, Nature, and Climate Change. Bloomsbury USA, New York.

Preston, Richard. 1994. The Hot Zone. Anchor Books, New York.

Stolzenburg, William, 2008. Where the Wild Things Were: Life, Death, and Ecological Wreckage in a Land of Vanishing Predators. Bloomsbury USA, 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 … for most of you, 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. For those of you who do aspire to a career in an ecology-related field, the hope is that you complete the course with a better understanding of the role humans have played, and continue to play, in shaping the "natural" world upon which we are dependent.

SCHEDULE

Biogeochemical Cycles, Energy Flow and Water
Required Reading: Fishman 2011

8 January	Th	Introduction
13	T	Biogeochemical Cycles and Energy Flow in Ecosystems
15	Th	Water Cycle and Biologically Significant Characteristics of Water
20	T	The Global Water Crisis
22	Th	The Global Water Crisis, Continued
27	T	*Examination No. 1: Covers 8 – 22 January*

Global Climate Change
Required Reading: Kolbert 2006

29	Th	Global Climate, Past and Present
3 February	T	Global Climate, Past and Present, Continued
5	Th	Causes of Change
10	T	Consequences of Change
12	Th	Consequences of Change, continued
		Deadline for approval of 1st paper title/topic

Biodiversity and Invasive Species
Required Reading: Stolzenburg 2008

17	T	Biodiversity and Species Diversity
19	Th	Patterns of Species Diversity
24	T	Threats to Biodiversity
26	Th	Invasive Species
3 March	T	Invasive Species, continued
5	Th	Why should we care?
10	T	*Examination No. 2: Covers 29 January – 5 March*

Emerging Infectious Diseases (EID's)
Required Reading: Preston 1994

12	Th	Video: Ebola – The Plague Fighters (NOVA), *1st paper due by midnight*
17-19	T, Th	Spring Break
24	T	What are EID's
26	Th	EID's of Particular Importance to Humans
		Deadline for approval of 2nd paper title/topic
31	T	Links Between EID's, Invasive Species and Climate Change
2 April	Th	Direct and Indirect Impacts of EID's on Humans

Populations
No Text

7	T	Characteristics of Populations
9	Th	Population Growth and Regulation
14	T	Human Population Growth; *2nd paper due* by midnight
16	Th	Consequences of Human Overpopulation
21	T	Consequences of Human Overpopulation, continued

Course Summary

23	T	Summary Discussion
5 May	T	*Examination No. 3: Covers 12 – 23 March – 23 April; 2:45 - 4:45 PM in 575 Dabney*

Friday, January 16th: Last Day to Drop Without a W

Tuesday, March 31st: Last Day to Drop With a W

Biology Degree Learning Objectives: For those of you who are majoring in Biology in the College of Arts & Sciences, our goal is that by the time you complete the requirements for a Bachelor of Science degree you will be able to explain and provide examples of the Five Big Ideas in biology, as presented in the Vision and Change in Biology Education document of the American Association for the Advancement of Science (AAAS) and the National Science Foundation (NSF), as they relate to those areas of biology to which you have been exposed while you were a student at the University of Tennessee, Knoxville. This course is designed to contribute to your understanding of each of these ideas.

- **Evolution:** Populations of organisms and their cellular components have changed over time through both selective and non-selective evolutionary processes.

- **Structure and Function:** All living systems (organisms, ecosystems, etc.) are made of structural components whose arrangement determines the function of the systems.

- **Information Flow and Storage:** Information (DNA, for example) and signals are used and exchanged within and among organisms to direct their functioning.

- **Transformation of Energy and Matter:** All living things acquire, use, and release and cycle matter and energy for cellular/organismal functioning.

- **Systems:** Living systems are interconnected, and they interact and influence each other on multiple levels.

In addition, you should also be proficient in the following scientific practices: a) formulating empirically-testable hypotheses, b) interpreting visual representations such as figures and graphs, and c) evaluating data and coming to a conclusion based on an analysis of those data.

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 worthy a maximum of 50 points each. Copies of past examinations will not be distributed, but a study guide (review questions) will be distributed prior to each exam. Make-Up Exams will be given, however, a) you must have a reasonable excuse for missing the scheduled exam that is accepted by Dr. Echternacht and b) although a make-up exam will cover the same material as the scheduled exam, the questions will be different as may the format.

How to Prepare for Examinations: Each module of the course covers about 1½ weeks. For the modules for which a book has been assigned, read the book over that period. Do NOT attempt to read an entire book a few days before the exam that covers the module in which the book has been assigned. 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. The latter is best done informally 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.

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 stated in the schedule. The papers must be no less than 5 pages and no more than 7 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 6 sources must be cited, and no more than 1/3 of the sources can be internet sources that are not also available in print form. One copy of each of your papers must be presented to the instructor on or before the due date indicated in the syllabus, as an email attachment in Word. Each paper will account for a maximum of 25 points in the calculation of your final grade. Formatting details will be discussed in class and guidelines will be distributed in class and posted on Blackboard.

Take-home Exercises: There will be a web-based take-home exercise associated with each of the 5 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. Because the exercises will be the basis for discussion in the class session following the date and time on which they were due, 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). Except in certain emergency situations, there are no excused absences. If you are in class and turn in the attendance form, you will receive one point for that day (total possible points = 26). If not, you won't, no matter why you had to be absent.

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 often bring different, and valuable perspectives to the topic we are discussing.

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: Dr. Echternacht does not have regularly scheduled office hours. He 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, and exam review questions will be posted on Blackboard.

Academic Integrity: Your continued participation in this class assumes that you abide by the University of Tennessee Honor Code (Undergraduate Catalog 2014-2015): "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."

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: 2227 Dunford Hall. Phone: 865-974-6087. E-mail: ods@utk.edu. Website: http:ods.utk.edu.