

Exploring sustainable human-environment interactions with  
Case studies highlighting the role of soils in maintaining environmental quality

**Instructor:** Jason Kaye, ASI 416 (office)

**Schedule #:** 672853

**Credit:** 3 hours

**Contact info:** office phone 863-1614; e-mail: jpk12@psu.edu

**Office hours:** W 11:00 – 2:00 in ASI 416, or by appointment

**Prerequisites:** None

**Regular meeting time and location:** T, Th 1:00-2:15 in 316 Wagner

**Required Texts:** Environment: The science behind the stories by Brennen and Withgott  
The Earth remains forever by Rob Jackson

**Other Required Reading:** Class handouts and papers assigned during the semester from Angel.

**Website:** I will use the course ANGEL site to communicate with students and post assignments

**Introduction:** This is a course about how people interact with the environment. For millennia, human-environment interactions have been shaped by the quest for food. This is still true today. But the modern quest is especially interesting because we are attempting an extraordinary feat - feeding 10 billion people. There can be no doubt that feeding the growing population requires tradeoffs between people and environmental health. Sustainability offers a framework to think about these tradeoffs by considering the needs of current society as well as the long-term costs for future societies and the environment. This class provides an introduction to the concept of environmental sustainability for students with no background in environmental science or soils.

**Course goals:** The goal of the course is to develop critical thinking skills related to sustainable environmental choices. As we explore the concept of sustainability, we will discover the role of soil in mediating human-environment interactions by determining natural plant and animal abundance, supporting agriculture, and buffering the environment against modern pollution.

**Specific course objectives:** Students will complete the class with: 1) a survey of the key issues in environmental sustainability, 2) exposure to current scientific information related to these issues, 3) an enhanced ability to interpret environmental data, 3) an increased knowledge of the role of soils in maintaining environmental quality, 4) a significant depth of knowledge about “what it takes” to feed 10 billion people while maintaining a healthy environment.

**More on the course structure and my approach**

I intend to have fun teaching this class and it is my hope that students will have fun as well. I have tried to structure the course with a variety of interactions between the students and instructor and among students. I expect that about 1/3 of class time will be occupied by “mini-lectures”. About 1/5 of the class will be spent on “sustainability walks” to see examples of sustainable environmental choices near campus. The rest of the class time will be spent on active learning, discussions, or exams. While we will review and interpret scientific concepts and data related to environmental sustainability, this will not be a highly technical class. The class will also discuss values, to understand how two people who look at the same scientific data can come to very different conclusions about what the data mean. In developing the material, I have tried to make sure that the course will not focus on a long list of the ways that people harm the environment.

## General Schedule:

This schedule will form the foundation for the course, but may change in response to student input and weather. This is especially true for the “sustainability walks” because we don’t want to take those in the rain. The exam dates and essay due dates will not change.

Week of:	Topic	Reading	Assignments
<i>Theme 1: The science of nature and the nature of science</i>			
Jan 10	Introduction		
Jan 12	Ways of knowing nature	BW 1	
Jan 17	Ways to value nature	BW 2,3	<b>HW1:</b> Expectations
Jan 19	History		
<i>Theme 2: Population and consumption: challenges to sustainability</i>			
Jan 23	Population	BW 7 and pages 136-137 J Living with success	<b>HW2:</b> Your footprint
Jan 26	Consumption	BW 17,18	<b>Essay 1</b> Due
Jan 31	Walk: green bldg	BW Parts of 16	
Feb 2	Consumption, Energy, Carbon	BW pages 104-106; 186	
<i>Theme 3: The Malthusian dilemma: feeding billions of people</i>			
Feb 7	History: feeding the world	BW 8,9	
Feb 9	<b>Exam 1</b> - Kaye gone		
Feb 14	Walk: an ag soil	BW No till case	
Feb 16	Meat and sustainability	BW 9	
Feb 21	GMO's	BW 9	<b>HW3:</b> Where does your food come from?
Feb 23	Pesticides	BW 10	
Feb 27	Organic ag	BW 287-291	
Mar 2	Organic ag		
Mar 7	Spring Break		
Mar 9	Spring Break		
<i>Theme 4: The conservation dilemma: maintaining a healthy environment</i>			
Mar 14	Walk: a forest soil	J Richness of life	
Mar 16	History: Conservation	BW 15, Parts of 5	
Mar 21	Env Systems-esp Soils	BW 6,8	<b>Essay 2</b> due
Mar 23	Walk: forest carbon		
Mar 28	<b>Exam 2</b>		<b>HW4:</b> clean energy expo (31 <sup>st</sup> and 1 <sup>st</sup> )
Mar 30	Climate change	BW 12; J changing Earth	
Apr 4	Air pollution	BW 11	
Apr 6	Water pollution and waste	BW 14, 19	
<i>Theme 5: Success stories in sustainable science and policy</i>			
Apr 11	Walk: Center for Sus		<b>Essay 3</b> due
Apr 13	The global N cycle	BW pages 180-188	
Apr 18	Ozone: Montreal Protocol	BW 11; J Ozone	
Apr 20	Warming: Kyoto Protocol	BW 12	
Apr 25	Chesapeake Bay	State of the Bay 2005	<b>Essay 4</b> due
Apr 27	Walk: ????		
Final Exam			

## Grading scheme

The course grade will be determined by four types of assessment

1. Exams: 3 worth 10 % each = **30 %** of course final grade
2. Essays: 4 worth 7.5 % each = **30 %** of course final grade
3. Class participation = **20 %** of course final grade
4. Homework: four worth 5% each = **20%** of course final grade

The specific grading approach for each of these four assessment types is outlined here:

1. **Exams.** The exams will include a variety of question types (multiple choice, short answer etc.). On the exams, the value of each question will be clearly noted beside that question. A study guide will be handed out at least one class period prior to each exam and exam questions will be drawn from the material highlighted in the study guide.
2. **Essays.** The essays should be a personal response to the assigned reading in Jackson's book (*The earth remains forever*). Rob Jackson is an internationally respected ecosystem scientist, but in this book he is trying to reach people who have become disenchanted with the environmental movement. The author is walking the line between scientist and advocate. The book is a mix of scientific analysis and Jackson's personal reflection on the state of the environment. I would like your essays to follow this model. The essays should be personal reflections, but they should also reflect that you are thinking deeply about the information at hand – that is, the information presented in Jackson's book and in class. You are free to respond to any of the points made in the book. While the essays should be personal, they should NOT be written as a stream-of-consciousness. You should develop a structure for the essay so that it conveys a clear and succinct message. Follow the adage: "say what you are going to say, say it, say what you have said." It is also important that your essay develops an original thought – it would be inappropriate to simply summarize the reading. The essays can be anywhere from 1 to 3 typewritten, single-spaced pages, and as long as you are within these guidelines length will not be a factor in the grade (If you write neatly I'll accept 2 to 4 pages handwritten). Grading rubric for the essays will be as follows: F – no analysis of the reading, and no original thought developed; D – minimal analysis of the reading, and minimal original thought development; C – it is clear that you have engaged with and analyzed the reading and have developed an original and well organized response; B – all requirements for C are met, plus the essay displays an above average analysis of the reading OR an above average development of the original response; A – all requirements for B are met, but the essay displays an above average analysis of the reading AND an above average development of the original response.
3. **Class Participation:** I hope to foster a classroom of active exchange among students and between students and the instructor. I will foster these exchanges through class discussions, active learning in groups, and sustainability walks outside the classroom. However, I can't create a conversation alone – you must all participate. Successful class participation requires preparation – students who are behind on the reading will feel less confident participating in class. Successful class discussions also require the right atmosphere, we must all remember to be courteous in our comments and criticisms and open to contrasting ideas from others. Remember to criticize ideas, not people. Occasionally I will ask you to prepare by reading or studying some graphs prior to coming to class. Grading rubric for class participation: A – Student initiates and

facilitates discussion regularly by raising and responding to questions. To earn an A, students must occasionally (several times over the semester but not at every discussion) offer comments that provide new and interesting ideas that benefit the entire class, rather than simply following the lead of others. B – Student is well prepared and participates regularly and productively, but is not occasionally taking a leadership role in discussion. C – Student is generally prepared, but participates occasionally in discussions and mainly in response to ideas from the instructor or other students. D – Student is often unprepared for discussions and contributes infrequently. F – Students who do not participate will receive an F. By definition, if you miss class frequently you can not participate, and thus, will receive an F. This grade is also reserved for students that are frequently discourteous during discussions (by the way, I almost never see this).

4. **Homework assignments** will be graded to see that the assignment was completed and the grade will be either credit or no credit. If you hand in all of the homework assignments on time you will receive full credit for 20% of your grade. These assignments vary greatly, so instructions and due dates will be given at the time of the assignment.

### **University Academic Integrity Statement**

Academic integrity, as defined by University Faculty Senate Policy 49-20, is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabrication of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.