

Syllabus^{COURSE}

SCI/256 Version 3

People, Science, and the Environment

John Ensworth- Instructor

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Course Syllabus

Course Title:	SCI 256 People, Science, and The Environment
Course Schedule:	Thursdays April 29 –May 27th - 11:59pm
Course Location/	University of Phoenix –MD Campus Directed Study
Required Text:	Botkin, D. B., & Keller, E. A. (2009). <i>Environmental science: Earth as a living planet</i> (7th ed.). Hoboken, NJ: Wiley. All electronic materials are available on your student Web site.
Electronic Resources:	All class correspondence including submitted homework (and returned graded homework) must be conducted via the <u>Online Learning System Forums (See section below)</u> As a backup, you may go to my personal website for resources. www.bikerjohn.com/classes/UoP_enviro_n_sci/ or www.bikerjohn.com other links Education this class link The videos for the optional paper are available only on this site.
Instructor's Name:	John Ensworth
Telephone:	Use the online learning system forum for all correspondence. Call only in the event of an emergency. 703-618-6773 (cell), 703-426-9658 (home)
UOP E-mail Address:	Use the online learning system forum for all email correspondence. Only use the emails below in an emergency (the johnensworth@yahoo.com (ok for large attachments)
Availability:	Email anytime. Snail-Mail: Available upon request as a last resort!

Welcome!

We're going to explore a WIDE range of scientific disciplines and political policies. Come ready to participate in lively discussion of hot topics (drink extra coffee if you need to!).

Instructor Bio

I am currently the Senior Science Education Specialist at the Institute for Global Environmental Strategies which is a non-profit organization formed (among other things) to conduct independent reviews on all Earth and space science education products produced by or for NASA. My position is the one responsible for directly conducting these reviews and yearly workshops at NASA centers and at the large education conferences (i.e. NSTA, NCTM) that introduce the products that pass on the criteria of scientific accuracy and classroom usability.

For the last decade I was a masters student and a PhD candidate in meteorology at the University of Oklahoma. I have earned undergraduate degrees in physics, astronomy, geography and meteorology with minors in math and computer science.

I became interested in astronomy in the 2nd grade and began to teach astronomy to cub scouts and boy scouts by the 5th grade. I began to work for the Arizona State University planetarium when Halley's Comet paid the inner solar system a visit in 1985-1986 and taught the astronomy labs, became head TA and eventually taught an astronomy class through the rest of the 80's (as an undergraduate). I have worked an internship at Steward Observatory, The University of Arizona, Tucson site testing for the placement of the Mt. Graham

observatory complex. I've also observed at the 4-meter telescope at Kitt Peak, a 36" telescope at Kitt Peak, and at the Multi-Mirror Telescope at Mt. Whipple.

More recently, I've successfully run 43 astronomy nights for Norman residents and OU students and have worked at the Oklahoma City Omniplex Planetarium for 8 years. I've taught astronomy for the college degree completion program at Mid-America Christian University (formerly Mid-America Bible College) for the last 3 years and am a member of the Oklahoma City Astronomy Club. I have also served an internship at NASA Goddard Space Flight Center and am on contract to review space science and earth science teaching materials for effectiveness and content. There are other relevant bits of experience I could put here, but I'll save them for class when they come to mind.

In environmental science and related fields, I began to study meteorology and earth science in the 5th grade when my telescope got rained on during an freak night time desert thunderstorm. Convinced I could forecast better than the guys in Phoenix, I began to study the weather. In college I conducted the meteorological investigations for the placement (site testing) of the Mt. Graham Observatory complex and helped astronomers understand what makes stars twinkle (it is a blurring of the image caused by turbulence and density currents in the lower few hundred to a thousand feet in the atmosphere). I also worked on a project to trace the origin of air pollution in the Grand Canyon. As a graduate student I conducted field research on lightning, fine scale (time and space) rainfall variations, aided in a geographic study of rainfall and plant distributions by elevation at Black Mesa, OK, and chased tornadoes. I taught meteorology, earth system science and helped with environmental geography courses throughout the 1990's and into the 2000's. I keep the weather channel on enough at home to burn lines into the TV screen.

COURSE DESCRIPTION

This in-depth environmental science course examines how people use science to understand how they relate to the environment. The course explores relationships between people and ecosystems and the science behind how ecosystems work. It reviews the historical development of the environmental movement, interactions between humans and natural ecosystems, and more specifically, the role of a growing population and associated pressures on natural resources. This course further examines how economics, natural systems, and conservation are interrelated. The many forms of pollution as well as types of energy resources are addressed. This course challenges students to consider the impact of lifestyle choices on environmental sustainability.

TOPICS AND OBJECTIVES

Week One: Environmental Science

- Describe the historical development of the environmental movement.
- Identify human population impacts on the environment.
- Explain how principles of system theory apply to the Earth as a living system.

Week Two: Ecosystem Structure, Function, and Change

- Describe structural and functional dynamics of ecosystems.
- Identify how humans affect biogeochemical cycles.
- Explain how knowledge about ecosystem structure and function can be applied to ecosystem management and restoration.

Week Three: Natural Resource and Energy

- Identify impacts to ecosystems and wild species from a growing human population.
- Compare benefits and risks associated with use of nonrenewable and renewable energy resources.
- Identify management practices for sustainability and conservation of natural resources.

Week Four: Environmental Pollution

- Describe water management and its effects on the environment.
- Identify potential impacts of environmental pollution to human and ecosystem health.
- Identify causes of pollution and its treatments.
- Explain the causes and effects of global warming.

Week Five: Environmental Economics, Policies, and Choices

- Perform an economic analysis of environmental issues.
- Analyze the role of global, national, and regional policies and decisions on environmental issues.

Point Values for the Course Assignments

Week One	
Individual Assignment: Environmental Science Worksheet	10
Week Two	
Individual Assignment: Biotic Components Paper	10
Week Three	
Learning Team Assignment: Natural Resources and Energy Paper	20
Week Four	
Individual Assignment: Environmental Pollution Outline	10
Week Five	
Individual Assignment: Final Examination*	20
Learning Team Assignment: Economic Analysis Presentation**	10
All Weeks	
Participation & Discussion Questions	20
Assignment Totals	
Individual	70
Learning Team	30
Point Total	100

Course Changes

Please note that the instructor's assignments may vary from the original syllabus you received from the student web page. Assignments in this document take priority. While the reading assignments and learning objectives remain the same, some of the assignments in this syllabus have been customized for this particular section. (Instructors note: I'll be sticking to the planned course unless unusual circumstances arise. Any changes made will be advertised in the Online Learning System Forums and on the course web site.

http://www.bikerjohn.com/classes/UoP_environ_sci/

Policies and Procedures

Online Learning System Forums

Assignment Submission

Assignments are due at 11:59pm on their due date via the OLS Forum. See the section on the Online Learning System Forums below.

Attendance is defined as weekly contact with the assigned faculty member. This student contact with the faculty member may be either written or verbal communication, including the submission of required course assignments. Assignments are due at 11:59p.m. on the due date beginning with your Week 1 assignment being submitted on the first date listed

If you are absent for a total of two weeks during a five or six-workshop course, an automatic withdrawal will occur. In other words, you will not earn course credit or a letter grade for the course. A "W" or "F" will be entered for the course. A "W" grade will be issued if the student attends at least one workshop of a course and withdraws from the course with a passing grade or withdraws before week 3. An "F" grade will be issued if the student attends three or more workshops of a course and the work submitted is below 60% or the student fails to submit assignments.

The Forums Themselves

We will have a set of Online Learning System forums available to us during this class. To access the forums, click on the **Go to class** link on your student website.

These web-based forums provide you with:

1. a common area solely for our class group (**Main forum**) where you can post questions between our on-campus workshop meetings;
2. a **Chat Room forum** which you can use for non-class interactions with classmates (be sure to honor the Student Code of Conduct in this, and every, forum!);
3. electronic access to the course syllabus which will be used in this class (see the syllabus in the **Course Materials forum**);
4. electronic venues for Learning Team meetings and team paper drafts to use as each team deems best (I will assign a specific **Learning Team forum** for each team's use during our first on-campus workshop meeting). Learning Team meetings should be documented here regardless of the mode students chose to actually meet; and
5. a personalized electronic drop-box – **Individual Forum** - for completed assignments. Students will not be able to see or access any private forum except the one created for him or her individually.

The forums exist to enhance our ability to communicate throughout the course.

If you have any questions about the class forums, please inform me.

Attendance and participation

You should be present for all sessions. UOP policy allows you only one absence from class. If you know that you will be absent from a session, please let me know. Students who exhibit excessive tardiness and leaving early will have points deducted in their overall course grade and *will not be* rendered the grade "A." ***Students do not allow lateness or absenteeism to be the demise of your grade; showing up is half way on the road to success.***

EVALUATION CRITERIA FOR WRITTEN WORK:

Science Content	50%
Writing Flow/Readability/Appearance (see APA guidelines or similar)	20%
Correct Length (not relying heavily on large chunks of quoted material)	10%
Spelling/Grammar	10%
Citations/Bibliography (+correct format)	10%

Late assignments

ASSIGNMENTS ARE DUE ON THE DAY THEY ARE DUE. A 10% penalty per week, beginning the week after the assignment is due, will be assessed for all late work. That is, I will score the paper and then deduct 10% of the total from that score. The assignment of an A in cases of late work will be rare (for all practical purposes, impossible), as timeliness is a requisite in defining excellence.

Paper Replacement Offer: You may replace any individual (non-extra credit) paper with a one page write up of your opinions after watching both:

"An Inconvenient Truth" by Al Gore (DVD - Rental, Library etc or my class Website called **Video for Paper 1**) and

"Exposed: Climate of Fear" by Glenn Beck (YouTube in 6 parts)

See class Website for link called **Video for Paper 2.**

http://www.bikerjohn.com/classes/UoP_enviro_n_sci/

Feedback

I will make comments on each of your written assignments and return weekly. Please keep track of your score to help give yourself a weekly report of how you are doing in class. Seven days after the end of your class, you may pick up your last paper and any additional feedback reports from the front office.

How points and percentages equate to grades

100-95	A	76-74	C
94-90	A-	73-70	C-
89-87	B+	69-67	D+
86-84	B	66-64	D
83-80	B-	62-60	D-
79-77	C+	59 or <	F

Week One

Environmental Science

- Describe the historical development of the environmental movement.
- Identify human population impacts on the environment.
- Explain how principles of system theory apply to the Earth as a living system.

Course Assignments

1. Readings

- **Read** Ch. 1–4 of the text.
- **Review** animation and video clip resources available for these chapters.
- **Read** this week's Electronic Reserve Readings.

2. Nongraded Activities and Preparation

- **Become** familiar with WileyPlus, an interactive supplemental Web site designed to provide the chapter readings for this course. In addition to the readings, WileyPlus provides additional resources such as video clips, animations, interactive activities, and so forth, to help clarify the concepts covered in this course. The links to WileyPlus are available on the weekly course pages.

3. Individual Assignment: Environmental Science Worksheet

- **Complete** the worksheet found in Week One on the student Web site.

4. Learning Team Instructions

- **Resource:** Learning Team Toolkit
- **Complete** the Learning Team Charter.

5. Discussion Questions

- In your opinion, what are the benefits and constraints of using the scientific method to analyze environmental decisions?
- In your opinion, why is it significant to think about the age composition of a human population?
- Why is it difficult to calculate the increase of the human population?
- What is an example of a J-curve population in nature? Explain.
- What are some social, economic, aesthetics, and ethical issues involved in a current environmental controversy? Explain.
- What is zero population growth? Is this a reasonable and attainable goal for the global human population?

Week Two

Ecosystem Structure, Function, and Change

- Describe structural and functional dynamics of ecosystems.
- Identify how humans affect biogeochemical cycles.
- Explain how knowledge about ecosystem structure and function can be applied to ecosystem management and restoration.

Course Assignments

1. Readings

- **Read** Ch. 5–6 & 9–10 of the text.
- **Review** animation and video clip resources available for these chapters.
- **Read** this week's Electronic Reserve Readings.

2. Individual Assignment: Biotic Components Paper

- **Select** a representative natural ecosystem in your area such as preserves or parks that are managed for native species.
- **Write** a 700- to 1,050-word paper explaining:
 - The major structural and functional dynamics (processes) of that ecosystem including change over time
 - How humans may have affected biogeochemical cycles in that ecosystem
 - How knowledge about that ecosystem's structure and function can help or has helped to develop plans for its management and restoration
- **Include** two outside references.
- **Format** your paper according to APA standards.

3. Learning Team Instructions

- **Begin** Natural Resources and Energy Paper due in Week Three.

4. Discussion Questions

- Identify a natural ecosystem in which you live or one near to where you live? How does this ecosystem support you? At what trophic level are you? Why?
- Why can it be difficult to identify the boundaries of an ecosystem? How can environmental scientists resolve this boundary issue when studying an ecosystem?
- Why is understanding biogeochemical cycles important to environmental science? Provide an example.
- What are the similarities and differences between an ecosystem and an ecological community? How does this apply to your community?
- Because ecosystems change and may recover naturally from disturbance over time, what factors affect decisions about whether human intervention is needed to help ecosystem recovery? Provide examples.
- What are some human impacts on the natural cycling process of ecosystems in your community?

Week Three

Natural Resource and Energy

- Identify impacts to ecosystems and wild species from a growing human population.
- Compare benefits and risks associated with use of nonrenewable and renewable energy resources.
- Identify management practices for sustainability and conservation of natural resources.

Course Assignments

1. Readings

- **Read** Ch. 11–14 & 17–20 of the text.
- **Review** animation and video clip resources available for these chapters.
- **Read** this week's Electronic Reserve Readings.

2. Learning Team Assignment: Natural Resources and Energy Paper

- **Write** a 1,400- to 1,750-word paper on natural resources and energy. Include the following:
 - Choose a specific ecosystem, such as a forest, a grassland, or a marine or freshwater aquatic ecosystem.
 - Identify and discuss the effects that a growing human population may have on that ecosystem's resources, including loss or harm to populations of wild species.
 - Discuss one management practice for sustainability and conservation of natural resources in that ecosystem.
 - Identify the risks and benefits of extracting or using one type of nonrenewable and one type of renewable energy resource from that ecosystem, or in areas near that ecosystem.
- **Include** two outside references.
- **Format** your paper according to APA standards.

3. Discussion Questions

- In your community, what aspects of suburban sprawl and urban blight are evident? Identify how the effects from these might be alleviated.
- Is your community people- or car-oriented? Why or why not? How does that affect energy use and sustainability of your community?
- Are there personal impacts of having more biodiversity or less biodiversity in your community? Explain.
- What is one major cause of present-day species extinction? Explain how this extinction came about and what could have been done to prevent it.
- What are the advantages and disadvantages of soft-path energy development compared to hard-path energy development?

Week Four

Environmental Pollution

- Describe water management and its effects on the environment.
- Identify potential impacts of environmental pollution to human and ecosystem health.
- Identify causes of pollution and its treatments.
- Explain the causes and effects of global warming.

Course Assignments

1. Readings

- **Read** Ch. 21–25 of the text.
- **Review** animation and video clip resources available for these chapters.
- **Read** this week's Electronic Reserve Readings.

2. Nongraded Activities and Preparation

- **Prepare** for the Final Examination in Week Five.

3. Individual Assignment: Environmental Pollution Outline

- **View** the simulation “Managing Environmental Concerns and Resources” found in Week Four of the student Web site in preparation to complete the outline.
- **Complete** the Environmental Pollution Outline found in Week Four on the student Web site.

4. Learning Team Instructions

- **Begin** Economic Analysis Presentation due in Week Five.

5. Discussion Questions

- In-stream use is a controversial issue. What is your opinion on in-stream use and defend your stance?
- How could your community better manage its water resources?
- What is one way natural ecosystems can perform wastewater treatment? Explain.
- How is the London 1952 fog event similar/different to the smog problem in the Los Angeles basin?
- What are some of the causes of both indoor and outdoor air pollution where you live, work, or attend school? How does this affect that environment?
- Why do you feel there is debate about policies to reduce greenhouse gas emissions? How can science help resolve the debate?

Week Five

Environmental Economics, Policies, and Choices

- Perform an economic analysis of environmental issues.
- Analyze the role of global, national, and regional policies and decisions on environmental issues.

Course Assignments

1. Readings

- **Read** Ch. 27–29 of the text.
- **Review** animation and video clip resources available for these chapters.
- **Read** this week's Electronic Reserve Readings.

2. Individual Assignment: Final Examination

- **Prepare** to take final examination.

3. Learning Team Assignment: Economic Analysis Presentation

- **Perform** an economic analysis on an assigned environmental issue in the world today.
- **Prepare** a 15- to 20-minute oral presentation accompanied by 10 to 15 Microsoft® PowerPoint® slides. (Online Campus students must submit a 10 to 15 slide Microsoft® PowerPoint® presentation with detailed speaker's notes). Include the following:
 - Importance of economic analysis
 - Description (general overview) of the assigned environmental issue
 - Economic analysis of the environmental issue
 - Costs
 - Benefits
 - Risks
 - Limitations
 - Problems
 - How economic analysis can be used to determine the most effective and economical regulations or policies (see Ch. 28 of the text) to help solve the environmental concern
- **Include** two other resources aside from the textbook.

4. Discussion Questions

- Who should manage the natural resources: legislature, public, scientists, special interest groups, and why?
- What is an environmental issue in your local area that has been supported by a local conservation group? Explain the issue.
- How have environmental regulations implemented by local politicians affected your daily life? Provide an example.
- What has been the media coverage of a local environmental issue? Explain.
- What are some of the federally funded environmental management projects being completed by Civilian Conservation Corps, U.S Army Corps of Engineers, Bureau of Land Management, U.S. National Forest Service that have been completed in your area? Provide a summary of the project.