SCI126: ENVIRONMENTAL SCIENCE W/LAB

THIS COURSE DOES NOT REQUIRE A FINAL EXAM

SYLLABUS

READ THESE INSTRUCTIONS NOW!

1.) YOUR ASSIGNMENTS ARE ON YOUR SYLLABUS SO…

a.) Download & Save it

b.) Read it

c.) For textual readings, use the "Access Class Downloads" link on your class page. Any additional links will be on your syllabus.

2.) COMPLETING WORK

a.) Carefully read and get an understanding of what you are being asked to do

b.) Keep work organized by week, clearly labeled and typed or copy/paste onto your syllabus

c.) Math and hand done projects: photograph, scan or screenshot and copy/paste to your syllabus.

d.) Keep images small so your file isn't too large to submit or save work as a PDF.

e.) Use your class downloads and links as directed. Do not "Google" and plagiarize.

f.) Go to "Student Services - IPAD/APPLE/GOOGLE Support" to learn to submit work in other formats.

3.) SUBMITTING WORK

a.) **YOU MUST SUBMIT ALL SIX WEEKS AT ONCE. Go to the website and select "Student Services" and then "Submit Work".**

b.) You must have completed all 6 weeks of work AND placed it on your syllabus to submit your work for grading using the online form.

c.) You have two attempts at receiving a passing grade of "C" or better so submit your full effort original work. Work sent without a syllabus and/or disorganized will be rejected and issued a failing grade.

d.) MAILING WORK: You may also COPY your work and MAIL the originals to IOHS, PO BOX 759, Saint Helena Island, SC 29920. Mailed work will not be returned and you must include your syllabus.

4.) RECEIVING GRADES:

a.) The evaluator will grade each weekly assignment and average your grades.

b.) You will receive a reply in about 5 business days. Do not call or email asking for us to verify your work.

c.) If you have not received a reply in a week or need help, email "Homework Help" from website

d.) Your 5 weekly grades must average to a 2 ("C") or better to receive your credit.

e.) FINAL EXAMS: Go to "Student Support – Request Final Exam" after you submit (Math & World LANG)

All components of your course must be completed by the end of the 8th week from the time of your registration. If you have a medical emergency or disability preventing you from completing your class, contact "Homework Help" and send an email to request up to a 2-week extension. For urgent matters call or text 773-499-2668 anytime.

Plagiarism Statement

I understand that I must use research conventions to cite and clearly mark other people's ideas and words within my paper. I understand that plagiarism is an act of intellectual dishonesty. I understand it is academically unethical and unacceptable to do any of the following acts of which I will be immediately expelled without refund:

- **To submit an essay written in whole or in part by another student as if it were my own.**
- **To download an essay from the internet, then quote or paraphrase from it, in whole or in part, without acknowledging the original source.**
- **To restate a clever phrase *verbatim* from another writer without acknowledging the source.**
- **To paraphrase part of another writer's work without acknowledging the source.**
- **To reproduce the substance of another writer's argument without acknowledging the source.**
- **To take work originally done for one instructor's assignment and re-submit it to another teacher.**
- **To cheat on tests or quizzes through the use of crib sheets, hidden notes, viewing another student's paper, revealing the answers on my own paper to another student through verbal or textual communication, sign language, or other means of storing and communicating information--including electronic devices, recording devices, cellular telephones, headsets, and portable computers.**
- **To copy another student's work and submit the work as if it were the product of my own labor.**

IOHS ENVIRONMENTAL SCIENCE

"The Habitable Planet"

YOUR TEXTBOOK IS WITH YOUR DOWNLOADS AND ONLINE

ONLINE TEXT & MULTI-MEDIA COURSE LINK

Use the link to access the entire course and all weekly sections

https://www.learner.org/series/the-habitable-planet-a-systems-approach-to-environmental-science/

Each of the 13 Unit videos introduces key scientists and their research. They provide a strong overview of the topic under discussion, and may show the actual natural systems being discussed, or illustrate the nature of a phenomenon. Through these video interviews, viewers will get a sense of how and why these scientists do their research, have a look at some of the equipment and techniques they use, and learn about recognized recent shifts in each field.

The Habitable Planet: A Systems Approach to Environmental Science

- 1**Many Planets, One Earth**
- 2Atmosphere
- 3Oceans
- 4Ecosystems

- 5Human Population Dynamics
- 6Risk, Exposure, and Health
- 7Agriculture
- 8Water Resources
- 9Biodiversity Decline
- 10Energy Challenges
- 11Atmospheric Pollution
- 12Earth's Changing Climate
- 13Looking Forward: Our Global Experiment
- 14Carbon Lab
- 15Demographics Lab
- 16Disease Lab
- 17Ecology Lab
- 18Energy Lab

Be very detailed and explain each LAB clearly, responding to each question in full.

WEEK ONE

ASSIGNMENT: Watch the video for each unit using the link in the top box "Video Index". Provide a written summary for each individual video.

Read and study each Unit

1.) Many Planets, One Earth: Summarize the video

2.) Atmosphere: Summarize the video

3.) Oceans: Summarize the video

LAB:

Do the complete lab and submit written components below.

Be very detailed and explain each LAB clearly, responding to each question in full.

https://www.learner.org/series/the-habitable-planet-a-systems-approach-to-environmental-science/carbon-lab/

Carbon Lab (Units 1-3, 13)

Throughout this course, the carbon cycle is featured as one of the most important planetary systems. This lab uses a robust model of the carbon cycle to give you an intuitive sense for how the system works. It also allows you to experiment with how human inputs to the cycle might change global outcomes to the year 2100 and beyond. One especially relevant human impact is the increase in atmospheric CO_2 levels. Between 1850 and today, atmospheric concentrations have risen from 287 ppm (parts per million) to over 380 ppm – a level higher than any known on Earth in more than 30 million years (see Unit 12 to find out how scientists measure ancient atmospheric carbon levels). You will experiment with the human factors that contribute to this rise, and see how different inputs to the carbon cycle might affect concentrations of the greenhouse gas CO_2.

- The Carbon Cycle
- - Step 1

ASSIGNMENT – RESPOND ONLY TO…

1. What is the relationship between increased carbon in the ocean and increased carbon in the soil? How else might carbon be transferred to soil?

   - - Step 2

2. What is the relationship between an increase in total carbon concentration (the smokestack) and increased carbon in the ocean surface? How might this change marine life populations? What impact could fifty years at this level of emissions have on marine fauna? On marine flora?

3. In addition to circulating through the carbon cycle, where else might excess carbon be found? In fifty

years, where would you be most likely to see excess carbon?

ADD RESPONSE/S/ HERE

- Curb Emissions
- - Step 1

4. How has atmospheric carbon levels changed?

5. Without any fossil fuel consumption, which parts of the cycle have improved their carbon levels in comparison to previous data? Which sections of the cycle have improved from the previous levels you have recorded but still are increasing their carbon levels?

- - Step 2

6. What effect does a high carbon level have on the deep ocean? Why might it be important to keep an eye on the deep ocean carbon levels? What could that one number tell you about the cycle as a whole?

7. Try reducing the level of fossil fuel percentage increase and decrease deforestation by 50%. Predict what will happen to the atmospheric carbon levels and record it in your Data Table. Run the simulation to test your hypothesis. Were you correct? Were you surprised by the result? What about your result surprised you?

WEEK TWO

ASSIGNMENT: Watch the video for each unit using the link in the top box "Video Index". Provide a written summary for each individual video.

Read and study each Unit

4.) Ecosystems: Summarize the video

5.) Human Population Dynamics: Summarize the video

LAB:

Do the complete lab and submit written components below.

Be very detailed and explain each LAB clearly, responding to each question in full.

https://www.learner.org/series/the-habitable-planet-a-systems-approach-to-environmental-science/demographics-lab/

Demographics Lab (Units 5, 13)

Baby boom. Overpopulation. Birth dearth. These terms all refer to human population growth, and can conjure images of environmental and economic peril. Which are real issues, and should they matter to us?

Demographers like the US Census Bureau make population projections based on mathematical models. In this lab you will explore a fully functional simulation, based on real demographic data. You will examine important demographic trends through a series of guided lessons. After completing these lessons you will understand the factors that control human population growth, recognize the sea-change in human history that is the "demographic transition," and gain a sense of how population demographics has a very human impact in all areas of our habitable planet.

ADD RESPONSE/S/ HERE

- Lessons
  - The Demographic Transition

- - Step 1

1. How do you suppose living conditions differ between the country furthest along in the demographic transition compared to the country earliest in the transition? How would living conditions in these two countries affect both birth and death rates?

2. Think of three social factors that contribute to lower birth rates in the countries farther along. How might these social conditions be encouraged to emerge in less developed countries?

- - Step 2

3. How does the shape of the population pyramid differ from most developed to least developed country?

- Population Momentum
- - Step 1

4. How does an increase or decrease in the average childbearing age group change the population? Why do "first world" countries tend to have older childbearing women than "third world" countries?

- Step 2

5. Did the pattern of population change match your prediction? If not, why not? Compare the final population pyramid for Italy to the one you sketched of Nigeria. How do they compare, and why are they similar or different?
6. How are Italy's numbers different from Nigeria's? What do you think accounts for the difference?

WEEK THREE

ASSIGNMENT: Watch the video for each unit using the link in the top box "Video Index". Provide a written summary for each individual video.

Read and study each Unit

6.) Risk, Exposure and Health: Summarize Video

7.) Agriculture: Summarize Video

LAB:

Do the complete lab and submit written components below.

Be very detailed and explain each LAB clearly, responding to each question in full.

https://www.learner.org/series/the-habitable-planet-a-systems-approach-to-environmental-science/disease-lab/

Disease Lab (Unit 5, 6)

Recently, new diseases, such as SARS, and the potential for a pandemic avian flu have raised international concerns about health. As populations grow (see the Demographics lab), especially in densely packed urban areas, there is increased risk of disease transmission. This lab will allow you to explore various types of diseases: "Kold" is similar to the common cold, "Impfluenza" resembles a typical influenza outbreak, and "Red Death" represents a fast-spreading epidemic with a high mortality rate (such as avian flu if it were to develop through human-to-human transmission). What factors come into play in the spread of these diseases, and what can we do to counter them?

ADD RESPONSE/S/ HERE

- Lessons
  - The Virgin Field
  - - Step 1

    1. Do you get the exact same results each time? How do the results compare to each other and to your prediction? What factors might contribute to susceptibility to the disease?

  - - Step 2

2. What could be done to prevent the spread of disease in a low population density? What kinds of challenges would high population density present to these precautions?

Vaccination

- Step 1

3. Was your prediction correct? If not, why not?

4. Notice that Impfluenza, unlike Kold, has a death rate. How many people die, on average, when you run the simulator on the virgin field?

WEEK FOUR

ASSIGNMENT: Watch the video for each unit using the link in the top box "Video Index". Provide a written summary for each individual video.

Read and study each Unit

8.) Water Resources: Summarize the video

9.) Biodiversity Decline: Summarize the video

10.) Energy Challenges: Summarize the video

LAB:

Do the complete lab and submit written components below.

Be very detailed and explain each LAB clearly, responding to each question in full.

https://www.learner.org/series/the-habitable-planet-a-systems-approach-to-environmental-science/ecology-lab/

Ecology Lab (Units 4, 7, 9, 13)

As you learned in Unit 4, ecosystems are a complex and delicate balancing game. The addition or removal of any species affects many other species that might compete for or provide food. In this lab you will get a chance to "build your own" ecosystem, and explore the effects of these interrelationships.

ADD RESPONSE/S/ HERE

- Lessons
  - The Producers
  - - Challenge
  - - Step 1

1. Do you find one producer to be dominant? Why might one producer be dominant over another?

- Step 2

2. If the simulation included decomposers, how would your current results change?

  - Food Web
  - - Challenge
  - - Step 1

3. Was your prediction correct? How did you arrive at your prediction? What differences were there between your prediction and the simulation?

4. What would happen to this imaginary ecosystem if the producers were to die out?

Step 2

5. Was your prediction correct? How did you arrive at your prediction? What differences were there between your prediction and the simulation?

WEEK FIVE

ASSIGNMENT: Watch the video for each unit using the link in the top box "Video Index". Provide a written summary for each individual video.

Read and study each Unit

11. Atmospheric Pollution: Summarize the video

12.) Earth's Changing Climate: Summarize the video

13.) Looking Forward: Our Global Experiment: Summarize the video

LAB:

Do the complete lab and submit written components below.

Be very detailed and explain each LAB clearly, responding to each question in full.

https://www.learner.org/series/the-habitable-planet-a-systems-approach-to-environmental-science/energy-lab/

Energy Lab (Units 10, 12, 13)

In today's world, with populations and economies booming, the demand for energy is rising. A portfolio of different energy sources is used to meet this demand. Since there is no perfectly clean, safe, and inexpensive source of energy, the composition of this portfolio involves tradeoffs of safety, cost, and-of increasing concern-emissions of greenhouse gases such as CO_2 (if you haven't done the Carbon Cycle lab yet, we recommend you start there). In this lab, your challenge is to try to meet the world's projected energy demand by choosing from the available energy sources while keeping atmospheric CO_2 under control and avoiding the particular limits and pitfalls associated with each energy source.

ADD RESPONSE/S/ HERE

1. Lessons
    a. Managing Resources
    b. – Introduction
    c. Adjust the settings as stated in this introduction

- Step 1

2. How close was your prediction to any of the simulation runs? Were your simulation runs similar? How did they differ?

- Step 2

3. Was your prediction closer to the cheap and quick energy supply model or the eco–friendly model? Which model met both needs best? Is there a feasible way of bringing this model to fruition in the "real" world.

    a. Energy Efficiency
    b. - Introduction
    c. - Step 1

4. Considering what you read in the text, how realistic was your prediction? What kinds of problems occur in the simulation?

Step 2

5. What combination of parameters did you find for a "best case" scenario this time? Were they close to your prediction? Why might your prediction have been off? What kinds of problems/issues/factors come into play this time that weren't present previously?

6. Based on this simulation, what would need to be changed in American people's lives in order to meet the parameters you've designed in this model?

7. Considering what you now know about carbon emission issues (see the Carbon Lab) and energy/fuel sources, what might humans have to do in order to meet energy demands, maintain low CO_2 emission levels, and not cause further harm to the environment? What initial steps might we all take?

WEEK 6

BEYOND THE HABITABLE PLANET

Read and take notes. Share your notes for each section

Looking Forward: Our Global Experiment

- 1**Looking Forward: Our Global Experiment Video**
- 2Online Textbook
- 3Scientists
- 4Interview with Daniel Pauly
- 5Interview with Edward O. Wilson

Looking Forward: Provide Video Notes

https://www.learner.org/series/the-habitable-planet-a-systems-approach-to-environmental-science/looking-forward-our-global-experiment/looking-forward-our-global-experiment-video/

ADD NOTES HERE

Summaries

1. INTRODUCTION:
2. MEASURING (AND REDUCING) THE HUMAN FOOTPRINT
3. MULTIPLE STRESSES ON INTERCONNECTED SYSTEMS
4. CONFRONTING THE CLIMATE-ENERGY CHALLENGE

Provide summary notes for each chapter above

1.) Introduction
2.) Measuring and Reducing the Human Footprint

3.) Multiple Stress on Interconnected Systems
4.) Confronting the Climate-Energy Challenge