Introduction to Sustainability

Friday, 1st and 2nd period, 9:15 to 12:15, Blake Hall, Room 131


Supplemented with articles, youtube videos, and other texts.

Learning objectives:

Integrate the meaning of sustainability in your life and your values
Evaluate perspectives on sustainability regarding environmental, economic and social considerations
Use metrics for measuring components of sustainability
Define sustainability within various economic sectors
Explain sustainability actions at the local, state, country, and global scales

Grading schema:

Total points for written assignments: 50
Total points for presenting your work: 2 assignments, 10 points (expect 7 minutes of presentation, 3 minutes leading discussion with colleagues)
Midterm: 15 points
Final: 15 points

Week 1: Definitions of sustainability
Brundtland definition and evolution of thinking from that time
Simultaneously address economy, environment, and social well-being
Population, Affluence, Technology
Evolution of Environmental Policy in the US
Conservation Movement
Environmental Risk Management

Reading: Is Climate Disaster Inevitable?  http://www.nytimes.com/2015/01/18/opinion/sunday/is-a-climate-disaster-inevitable.html?_r=0

Assignment: (5 points) Watch “Doughnut Economics” on Youtube.
https://www.youtube.com/watch?v=CqJL-cM8gb4&feature=share

Write 3 paragraphs on how you would influence the highest resource users to change their consumption choices. Be prepared to discuss your ideas in class.

Week 2: History of environmental policy

Discussion of assignment on Doughnut Economics

Unintended consequences - Malaria

Public Health and climate change


Complex Global Environmental problems: Acid rain, Stratospheric Ozone Depletion, Climate Change, Coastal Hypoxia, Land Use/ Urban Sprawl, Inequalities (Income, gender, health, education)

Assignment: (10 points) Look back through history and choose one society. Did it survive so far? What practices were sustainable? What perturbations occurred to cause those societies to change/ collapse? (Use 3 sources and write 2 pages). (Selected students will lead a discussion in class on their findings.)

Week 3: Sustainability in water resources – the problem: water quantity and water quality

Students to report out on sustainable/ unsustainable societies.

Water cycle, water and wastewater treatment, stormwater management

Solid waste – recycling – litter – plastics in the ocean

Ocean acidification and eutrophication


Sustainability of water for arid communities/ coastal communities


Assignment: (5 points) Choose one city with CSO issues, and read their plan.

Philadelphia:
www.phillywatersheds.org/watershed_issues/stormwater_management/combined_sewer_system

And Green Infrastructure projects in Phila:
http://www.phillywatersheds.org/what_were_doing/green_infrastructure

Camden Smart: http://www.camdensmart.com/

Indianapolis: http://www.citizensenergygroup.com/Our-Company/Our-Projects/Dig-Indy/Regulation/Long-Term-Control-Plan

Seattle: http://www.kingcounty.gov/environment/wastewater/CSO.aspx

How does the plan measure success? How does it measure progress? Do you think it will work? Why or why not? Three paragraphs. Be prepared to discuss your findings.

**Week 4: Sustainable strategies for water, Energy sector**

Discussion on CSO and stormwater plans.

Estuaries/ Restoration of wetlands

Restoration of Barnegat Bay – 10 point plan

Restoration of Raritan River watershed

Restoration of wetlands around New Orleans http://www.commongroundrelief.org/

Water reuse

Case studies: Cape May, Tampa, Tel Aviv

Assignment: (10 points) Could water reuse be a solution for coastal areas of NJ which are projected to have a high population growth? Strategize about how to build support for water reuse. Two pages, 3 sources. Three students to lead discussion.

**Week 5: Energy**

**Water reuse – 5 students to lead the discussion**

**Energy sector**

Worldwide energy consumption, energy mix, management of waste generation, tradeoffs in air pollution, CO2 generation

Agriculture

Implications of animal and plant extinction

Choose one of the following subjects:

or

2) protection of old-growth forest by cutting trees, [http://www.nature.org/magazine/archives/beyond-the-timber-wars.xml](http://www.nature.org/magazine/archives/beyond-the-timber-wars.xml)

Discuss the importance of individual and non-profit group action versus governmental action in preserving and enhancing ecosystems for future generations. How do you see yourself influencing these kinds of projects?

3 paragraphs, but make them really good!

**Week 6:**

**Industrial Ecology, Life Cycle Analysis and Sustainability**

**Radiation primer**

**Agriculture and sustainability**

**Food**

Ecological footprint analysis,

Study for midterm

**Week 7: Midterm**

**Learn about the stock market**

**Dow Jones Sustainability Index assignment**

Dow Jones Sustainability Index

Assignment: (10 points) Pick 1 company in the Dow Jones Sustainability Index, and one competitor. Look back at the last year of stock performance for these two companies, as well as the overall Dow Jones index. Compare and contrast their approaches through researching their websites. Provide comments on what you think influenced the relative success of these companies. Three students to present their findings.

**Week 8: Waste**

Go over midterm
Discussion of Dow Jones

Environmental Systems Thinking

Life Cycle Analysis –

Climate change

Assignment: (10 points) Identify 5 actions that could be taken right now to combat climate change in a significant way (greater than 10 mg/L equivalent CO2 reduction from trend). Label whether they are voluntary or regulatory. Discuss the changes that would need to occur to our current global society for these actions to be undertaken on a meaningful scale. Are there environmental justice issues that would need to be addressed? If you were to implement just 2 of these actions, what kind of implementation timeline would be necessary?

Week 9: Field Trip to Ecocomplex, Bordentown, NJ

Bus leaves at 9:00, and will return by 12:15. This trip is mandatory.

Week 10: Toxic Substances: Environmental Risk, Risk Assessment, Risk management, risk communication

Discussion of Climate change assignment

Cumulative impacts, synergism, diverse populations

Risk prioritization schemes – probabilistic risk, scientific uncertainty. Of all the risks affecting a population, which are the most serious? Which are we capable of controlling (economically, technologically, and politically)? How do we accommodate competing goals (between individuals and groups, between present and future generations)?

Population article: (5 points, 3 paragraphs) Can a collapse of global civilization be avoided? Paul Ehrlich and Ann Ehrlich https://www.youtube.com/watch?v=MtaGNDqaUWoO

Week 11: Government systems vs voluntary actions

Discussion of Ehrlich

Citizen empowerment through information

Pollution Prevention, Right to Know, Toxic Catastrophe prevention - Mass Balance accounting – metrics

Balance between present and future consequences of decisions, realization that people don’t make choices based solely on risk, assessment of public values

How do we influence public behavior?
**Week 12: Redevelopment**

Shifting land uses

Trends in residential choices/ trends in commuting/ trends in shopping (on-line? Big box?)

Which trends could improve sustainability?

Brownfields – can they contribute to urban sustainability? What are the tradeoffs?

Case study: Camden brownfield initiative, success story,

Assignment: (10 points) find another redevelopment story and comment on its sustainability (This could be a redevelopment following Hurricane Sandy.) (2 pages, 3 sources) (Pictures are encouraged!)

**Week 13: Changing the culture**

Art

Report out on Redevelopment, 5 students to present

Discussion of Green jobs

**Week 14: Review and Prep for final exam**