Natural Science Inquiry

Portland State University
FRINQ UNST 286D Friday 9-1
Dr. Candace Gossen: gossen@pdx.edu
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CRN 45729
Cramer Hall 225

Conceptual content: An environmentally sustainable society is one that meets the current needs of its people for food, clean water, clean air, shelter and other basic resources without compromising the ability for future generations to meet their needs. Problems arising from the human need for energy and the environmental degradation that follows has created problems generating from a local to global scale. The nature and success in resolving these problems starts with a proper understanding of Ecology and how humans fit into nature. It is then that we can delve into inquiry and learn how to ask proper questions. From these questions we can test and answer the scientific cause and effect of the problems, as well as return to the socio-economic and political context of the original question and more importantly perhaps the spirit nature of life.

We begin the class with (You) asking "How big is your ecological footprint?" and then making a 10 week commitment to change something in your lifestyle and quantifying its affect. We will investigate, observe, test, write, graph, draw, debate, dialog, calculate and with determined focus, Learn!

This course will include team projects and fieldwork outside of class. We will ride share, camp and venture into Nature this term.

Reading Requirements:
A Sand County Almanac by Aldo Leopold
A Natural History of the Sense by Diane Ackerman

Additional articles will be posted in the online calendar for the class as assigned

Notes:

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Recommended:
Access to a computer will be very important, If you do not have an ODIN account with PSU please set up an account. Use campus labs if you do not have home internet access

Visit http://d2l.pdx.edu to find our course web site.

However, **no electronic devices** are allowed in class. Leave your cell phone off, computers in your backpack.

Since we meet only once each week it is vital NOT to miss any classes. A project will be given during class each Friday that is due at the beginning of class the following Friday. The assignment will incorporate essay, experiment, scientific method and research. Each Assignment is worth 50pts. x 9 weeks = 450 pts. A final Project will be worth 100pts for a term total of 550pts. All guidelines will be available on D2L. Check in everyday.

Assignments not listed here will be given in greater detail in class and on D2L

Films & Media Lectures:
There will be various films used to support the themes as noted in the weekly calendar. Most of these films are not available for rent, therefor you must be present for viewing. These films are critical and cannot be missed.

Fieldtrips: I have organized your class so that we have 4 hours of time to complete fieldwork and experiments. We will need to carpool to the Columbia River Gorge, to the Oregon Coast, to the San Juan Islands and within the city of Portland. The weekend camping trip TBD will require camping gear such as tents, sleeping bags and cooking equipment. These things can be rented if you do not own them. Begin a list now of what you will need so we can better help you.

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Essays and Research:

Proper reference citing:
Wilcox RV. Shifting roles and synthetic women in Star trek: the next generation. Stud Pop Culture. 1991;13:53-65.

Reasons for proper reference:
Why sources should be cited
• To show that your edit isn't original research.
• To ensure that the content of articles is credible and can be checked by any reader or editor.
• To help users find additional reliable information on the topic.
• To improve the overall credibility and authoritative character of Wikipedia.
• To reduce the likelihood of editorial disputes, or to resolve any that arise.
• To credit a source for providing useful information and to avoid claims of plagiarism.

Peer review articles are: (click on this link for a full disclosure of what a peer reviewed journal is, AND a link to click on Ulrich's directory to double check yourself) http://www.lib.utexas.edu/lsl/help/modules/peer.html

Be on time and turn assignments in promptly. The consequence to NOT participating, missing assignments, being late, adds UP. You earn points for participation, projects are graded by accumulation not deduction. Everyone begins with 550 points and each project gets deducted from your general debt. Sorta like life, you earn your worthiness to pay your existence here. We however are valued for our participation and learning E=MC2. Green Coins are earned on noted projects and extra credit options given. Worth 5pts each and can be used, traded or kept.

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"In light of knowledge attained, the happy achievement seems almost a matter of course, and any intelligent student can grasp it without too much trouble. But the years of anxious searching in the dark, with their intense longing, their alterations of confidence and exhaustion and the final emergence into the light -- only those who have experienced it can understand it.".....**Albert Einstein**

*Binder w/ 10 weekly tabs. Make a section for Week and subject matter so that you can reference it beyond this class. You will add articles and other materials into this binder over the 10 weeks of our class.

Exercises	Points Possible		
EcoFootprint	* (green coin)	Weekend Fieldtrip TBD (Fieldwork)	50
10 week Pledge	* (green coin)	Easter Island Presentation	Mission Theatre Feb 18 (green coin)
Salmon Forest Flow Diagram	50	Ecological Design (Applied)	50
Columbia River-Water	50	EcoHunt (fieldwork)	50
Columbia River-Plants (Fieldwork)	50	Earth Science	50
Ring of Fire	50	Biomimicry	50
Oregon Coast (Fieldwork)	50	Final Project (team)	100

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Week	Elemental Nature	Theme	Exercises	Reading & More	Project
Week One - January 10	Water & Forests (Biomes)	The Salmon Forest Film •Great Bear Rainforest •Keystone Species (Salmon) •Biomes, Ecosystems •Flow Diagrams •Git'Gat People •N15 & Hydrologic Cycle	Hoop of the People EcoFootprint http://www.earthday.org/footprint-calculator Redefine the Dream http://www.newdream.org/programs/redefining-the-dream/about-redefining-the-dream E=MC2 http://www.1728.org/einstein.htm	Wells checklist: http://solar783.com/wells_checklist_english.pdf Monterey Seafood Watch Pocket Guide http://www.montereybayaquarium.org/cr/cr_seafoodwatch/download.aspx The World's Biomes http://www.ucmp.berkeley.edu/glossary/gloss5/biome/ The David Suzuki Foundation http://www.davidsuzuki.org See D2L for Flow Chart examples	Bound: •Introduction (<1 page) •Flow Diagram •Research Salmon (Columbia River) •Observational data (10 people - 10 questions) •Report Findings •Create educational tool (1 page max)

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Week	Elemental Nature	Theme	Exercises	Reading & More	Project
Week Two - January 17	Wood (Ecosystems)	Ecology & Connections • Endemic Species • Isolated Ecosystems • Range of Tolerance • Dams • Celilo Falls	Cadillac Desert (Film) Water Quality (Experiment) Scientific Method Plants		Bound: • Introduction (<1 page) • Columbia River Natural History • Summary of Water Quality Test & Range of Tolerance for Salmon • Research Endemic Plant Species (photo & ID for field tirp) 1 page for each plant. Minimum 6 plants (non-Internet source)

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Week	Elemental Nature	Theme	Exercises	Reading & More	Project
Week Three - January 24	Wood (Micro)	Field trip to Oneonta Gorge •Isolated Micro ecosys-tems •endemic species •Geology of Columbia River Gorge	In the Field	See links D2L Dam Removal http://newswatch.nationalgeographic.com/2013/03/14/65-dams-removed-to-restore-rivers-in-2012/ Cadillac Desert by Marc Reisner http://www.ldeo.columbia.edu/~martins/hydro/case_studies/cadillac_desert.htm	Bound: •Photo Essay •Field Notes •Essay 2,000 words double-sided on Dam Removal
Week Four - January 31	Fire (global)	Food Garbage Archaeology & Taxonomy Fukushima Nuclear Waste (sym-bology for the Future) Ring of Fire	Lunch Project (bring your lunch to class) Shimisu City (Film) Symbology	Once & Future Landfills (pdf) http://solar783.com/solar783/landfills.pdf Ewaste http://ngm.nationalgeographic.com/geopedia/E-Waste	Bound: •Introduction (<1 page) •Summary of Lunch Project and relation to garbage in ocean •Waste solutions 2,000 words

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Week	Elemental Nature	Theme	Exercises	Reading & More	Project
Week Five - February 7	Oregon Coast Fire + Water	Tillamook Biodigester Coastal Ecosystem Grey Whale Migrations and Identifying	(Friday & Saturday Fieldtrip)		Bound: •Introduction (<1 page) •Summary Biodigester •Grey Whale Migration in the Pacific Ocean (food, pathways, ...) •Essay how does garbage and radioactive waste affect the whales 2,000 words) •Otters

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Week	Elemental Nature	Theme	Exercises	Reading & More	Project
Week Six - February 14	Earth + Air	Forests as Lungs of Planet Introduce Easter Island (Deforestation & Drought) Global Warming & The Greenhouse Effect	Mass Balance Equation (bring calculators) Atmospheric Physics (sheets given in class) Earth Science Experiment (in class Read the culture story before class http://islandheritage.org/wordpress/?page_id=144	global warming view 1 http://solar783.com/gw1.pdf global warming view 2 http://solar783.com/gw2.pdf greenhouse effect: http://www.solar783.com/solar783/greenhouse.jpg	Bound: • Introduction (<1 page) • Opposing views of Global Warming summary • Earth Science Experiment summary • Proposal for future (essay 2,000 words)
February 18 - Tuesday		Easter Island Presentation at the Mission Theatre OMSI Science Pub 7-9pm		https://www.omsi.edu/sciencepubportland/021814	

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Week	Elemental Nature	Theme	Exercises	Reading & More	Project
Week Seven - February 21	Nature	Biomimicry Ecological Design	Ecological Design (film)*	Living Building Challenge Biomimicry website	• Bound: • Introduction to Biomimicry • Design a nature solution to a current unsustainable problem (photos, sketches, writing, creative project of your design, credibly)
Week Eight - February 28	Design	Rules of Thumb	Reading Sun Charts Solar (HW & PV) Rainwater Collection	Calculators to class Malcolm Wells	• ReDiscovering America handouts
Week Nine - March 7	Sustainability		EcoHunt (fieldtrip in Portland)	Land Use Solar vs Coal http://solar-83.com/landusesolar.pdf	Bound: Photo Summary of EcoHunt Informational web page for sustainable places in portland EcoHunt (geocaching site)
Week Ten - March 14					

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Self-Evaluation http://solar783.com/wells_checklist_english.pdf

where i live	Pollutes -100	-50	+50	Regenerates +100
air	☐	☐	☐	☐
water	☐	☐	☐	☐
shelter	☐	☐	☐	☐
food	☐	☐	☐	☐
clothes	☐	☐	☐	☐
transportation	☐	☐	☐	☐
things	☐	☐	☐	☐
family	☐	☐	☐	☐
friends	☐	☐	☐	☐
activities	☐	☐	☐	☐
relationships	☐	☐	☐	☐
education	☐	☐	☐	☐

Total (add them all up)