Energy and Sustainability – Physics 405/505
Fall 2016
SUNY College at Cortland
Physics Department

Catalog Description

Study of the environmental and social impacts of energy production and consumption and the options for meeting society's needs for energy services through sustainable technologies and practices.

Textbooks

Required

- *Energy Systems Engineering* (3^{rd} Ed.) by Vanek, Albright, and Angenent ISBN:9781259585098.
- *Insurmountable Risks* by Brice Smith ISBN: 1571431624.

Instructor Information

Instructor: Douglas Armstead
Office: 127 Bowers (607) 753-2919
Office Hours: TWR 2-3pm and by appointment.
Email: douglas.armstead@cortland.edu
Lecture meets: MW 4:25pm-5:40pm in Moffett 107.
Course Website: http://facultyweb.cortland.edu/douglas.armstead/F16/EnergyAndSustainability.html

Expectations

What you should expect from me:

- Explanations of concepts that include concrete examples and, where reasonable, demonstrations.
- In-class examples that help you to develop the level of reasoning that is necessary to do the problems you will encounter in the homework and analyze news articles.
- Careful and respectful consideration of your questions and contributions.

- An open door policy–if my office door is open you should feel free to come in and talk about physics. This is in addition to my regularly scheduled office hours listed above.

What I expect of you:

- Your presence in class, both physical and mental, for the entire class period.
- To prepare for class. This includes doing the reading at a level that you arrive with questions in hand about the material and are ready to discuss it.
- When you have a question, ask it. Your fellow classmates will thank you–if you are unclear on something, chances are the person next to you is, too.
- Careful and respectful consideration of your class mates questions and contributions.
- Submit work for grading that is your own. If you copy from another student or source and submit it for a grade, then you risk receiving an F in the course.

Grades

The final score for the class is tallied using the following percentages:

Participation	10%
News Analysis	20%
Problem Sets	30%
Final Group Project	40% [15% for first draft, 25% final products(paper and presentation)].

Participation: In-class discussions will play an important role in this course so you attendence and participation is manditory.

New Analysis: Each week you are required to find an article from one of the following seven sources: NY Times, Washington Post, LA Times, Chicago Tribune, Fox News, CNN, or London Guardian concering that week's topic. You will write a 2-3 page critique (weekly for 505, biweekly for 405) focusing on what it gets wrong, what important information, ideas, or context it leaves out.

Problem sets: Problem sets will have you apply the ideas discussed that week, sometimes in a tradional problem set form, some times as pieces of an energy audit of campus buildings. Homework will typically be assigned on Wednesday and due on the following Wednesday, when solutions may be provided. Allowing late homework is not really in your best interest and will generally not be accepted.

Group Project: A semester-long group project (3 or 4 students per group) will be assigned in the second week of class and will involve both library research and gathering real-world data from on and off campus. The first draft is due November 16th.

The score is mapped into a grade roughly as:

Final %	Grade
90-100	As
80-89	Bs
70-79	Cs etc.

Academic Integrity

You are expected to observe the University's statements and procedures on Academic Integrity in the college handbook, Chapter 340. Ask me if you have any uncertainty about what it means to cheat or the distinction between proper collaboration and plagerism.

Students with a Disability

If you are a student with a disability and wish to request accomodations, please contact the office of Student Disability Services located in VanHoesen B-1 or call (607) 753-2066 for an appointment. Information regarding your disability will be treated in a confidential manner. Because requests for accommodation take time to review and many accommodations require early planning, requests for accommodations should be made as early as possible.

Class Schedule

All dates are tentative.

Week of	Topic
8/29	Introduction, overview, and energy sources
9/5	Economics and the pricing of energy
	Labor Day 9/5, no class.
9/12	Defining Sustainability
9/19	Fossil Fuels and Climate Change
9/26	Coal and Oil
10/3	Natural Gas and Nuclear
10/10	Hydroelectric and Wind
10/17	Wind
	Fall break 10/17, no class.
10/24	Solar
10/31	The power grid (current and future)
11/7	Biomass/Biofuels and Niche energy sources
11/14	HVAC
	Project Rough Draft due on 11/16.
11/21	Transportation (cars and trucks)
	Thanksgiving break, no class on 11/24.
11/8	Transportation (planes, trains and ships) and
	Models for a Sustainable Energy System
12/5	Model for a SES cont. and Group Project Presentations

Final Exam at 4-6pm on Monday December 12, 2016