

Energy and Sustainability – Physics 405/505  
Fall 2019  
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.

**Textbook (Required)**

*Energy Systems Engineering* (3<sup>rd</sup> Ed.) by Vanek, Albright, and Angenent ISBN:9781259585098.

**Instructor Information**

Instructor: Douglas Armstead

Office: 127 Bowers (607) 753-2919

Office Hours: MWR 1-2pm and by appointment.

Email: douglas.armstead@cortland.edu

Lecture meets: TR 2:50pm-4:05pm in Bowers 1113.

Course Website: <http://facultyweb.cortland.edu/douglas.armstead/F19/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 your attendance and participation is mandatory.

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 concerning 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 traditional problem set form, some times as pieces of an energy audit of campus buildings. 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.

## Class Schedule

All dates are tentative.

Week of	Topic
8/27	Introduction, overview, and energy sources
9/3	Economics and the pricing of energy
9/10	Defining Sustainability
9/17	Fossil Fuels and Climate Change
9/24	Coal and Oil
10/1	Natural Gas and Nuclear
10/8	Hydroelectric and Wind
10/15	Wind
	Fall break 10/15, no class.
10/22	Solar
10/29	The power grid (current and future)
11/5	Biomass/Biofuels and Niche energy sources
11/12	HVAC
	Project Rough Draft due on 11/14.
11/19	Transportation (cars and trucks)
11/26	Transportation (planes, trains and ships) and Models for a Sustainable Energy System
	Thanksgiving break, no class on 11/28.
12/3	Model for a SES cont. and Group Project Presentations

**Final Exam at 1:30-3:30pm on Friday December 13, 2019**

## Required Statements

### Academic Integrity Statement

All students are expected to uphold academic integrity standards. Plagiarism is defined as taking the ideas of others and using them as one's own without due credit. Students who cheat in examinations, course assignments, or plagiarize in this course may be disciplined in accordance with university rules and regulations.

### Disability Statement

As part of SUNY Cortland's commitment to a diverse, equitable, and inclusive environment, we strive to provide students with equal access to all courses. If you believe you will require accommodations in this course, please place a request with the Disability Resources Office at [disability.resources@cortland.edu](mailto:disability.resources@cortland.edu) or call 607-753-2967. Please note that accommodations are generally not provided retroactively so timely contact with the Disability Resources Office is important. All students should consider meeting with their course instructor who may be helpful in other ways.

## **Diversity Statement**

SUNY Cortland is dedicated to the premise that every individual is important in a unique way and contributes to the overall quality of the institution. We define diversity broadly to include all aspects of human difference. The College is committed to inclusion, equity, and access and thus committed to creating and sustaining a climate that is equitable, respectful and free from prejudice for students, faculty and staff. We value diversity in the learning environment and know that it enhances our ability to inspire students to learn, lead and serve in a changing world. We are committed to promoting a diverse and inclusive campus through the recruitment and retention of faculty, staff and students. As a community, we hold important the democracy of ideas, tempered by a commitment to free speech and the standards of inquiry and debate. To this end, we are dedicated to developing and sustaining a learning environment where it is safe to explore our differences and celebrate the richness inherent in our pluralistic society.

## **Inclusive Learning Environment Statement**

SUNY Cortland is committed to a diverse, equitable and inclusive environment. The course instructor honors this commitment and respects and values differences. All students enrolled in this course are expected to be considerate of others, promote a collaborative and supportive educational environment, and demonstrate respect for individuals with regard to ability or disability, age, ethnicity, gender, gender identity/expression, race, religion, sex, sexual orientation, socio-economic status or other aspects of identity. In an environment that fosters inclusion, students have the opportunity to bring their various identities into conversation as they find helpful, but are not expected to represent or speak for an entire group of people who share aspects of an identity. If you have any questions or concerns about this statement, contact the Institutional Equity and Inclusion Office at 607-753-2263.

## **Title IX Statement**

Title IX, when combined with New York Human Rights Law and the New York Education Law 129-B, prohibits discrimination, harassment and violence based on sex, gender, gender identity/expression, and/or sexual orientation in the education setting. The federal Clery Act and NY Education Law 129-B provide certain rights and responsibilities after an incident of sexual or interpersonal violence. When a violation occurs, victims and survivors are eligible for campus and community resources. Where the College has jurisdiction, it may investigate and take action in accordance with College policy. If you or someone you know wishes to report discrimination based in sex, gender, gender identity/expression, and/or sexual orientation, or wishes to report sexual harassment, sexual violence, stalking or relationship violence, please contact the Title IX Coordinator at 607-753-4550, or visit [cortland.edu/titleix](http://cortland.edu/titleix) to learn about all reporting options and resources. (Updated by SUNY Legal Feb. 1, 2018).