Physics 105

Fall 2013

Physics for Decision Makers: The Global Energy Crisis

Professor Steve Rolston

Course Description: The aim of this course is for you to learn how science attacks the *most* important societal issue facing our planet.

Specific objectives are:

- To understand the fundamental science of energy and energy usage in the world, and the human impact on the global climate.
- To learn, through the process of discovery, how science formulates questions and addresses them with reasoning, evidence, and argumentation.
- To address specific questions which must be asked and answered in order to understand the important societal questions of energy usage and environmental impact.

This is a *Marquee Science and Technology* Course: At the completion of a Marquee Course you should be able to:

1. Look at complex questions and identify the science in the question and how it impacts and is impacted by political, social, economic, and ethical dimensions
2. Understand the limits of scientific knowledge
3. Critically evaluate science arguments
4. Ask good questions
5. Find information using various sources and evaluate the veracity of the information
6. Communicate scientific ideas effectively
7. Relate science to a personal situation

Canvas software: Our course will utilize Canvas software for grades and assignments. The link to our class is found through https://elms.umd.edu

Text: *Energy, Environment, and Climate (Second Edition)* by Richard Wolfson – available at campus bookstore, but you will find it cheaper online.

Clickers: We will be using personal response devices – see clickers.umd.edu. The preferred device is a TurningPoint RF-LCD, which can be purchased at the bookstore or online through TurningPoint. These will be an important part of your grade so get one and bring to class. Register your clicker at clickers.umd.edu.

Classes: Lecture: Tuesday, Thursday 12:30 – 1:45 PM (PHYS 1201)

Discussion:

Section 0101 – Monday - 12:00pm- 12:50pm (PHYS 0405)

Section 0102 – Monday - 1:00pm- 1:50pm (PHYS 0405)

Section 0104 – Friday - 12:00pm- 12:50pm (PHYS 1219)

Section 0105 – Friday - 2:00pm- 2:50pm (PHYS 1219)

Attendance: This is not going to be your standard lecture course where you sit passively watching Power Point slides drift by in front of your eyes. The class will be highly interactive, with in-class group activities and responses. Your attendance is critical to your success. Participation in class and discussion sections will be part of your grade.

Contact Information: Prof. Steve Rolston

Office: Computer and Space Sciences 2203

Phone: (301) 405-7189 Email: rolston@umd.edu

Office hours: Tuesday after class (drop in is OK)

Reading: There will be reading assignments to be completed *before* each class, and a short assignment (typically a short answer to a single question) related to the reading. There will be discussion related to the reading in class, so be sure to do your reading – you may be asked about it!

Homework: There will be two components to the homework. Each week you will find and submit a link to a relevant article in the media. Be prepared to summarize and discuss in class. Other homework will be assigned approximately every other week. All assignments will be posted on our course website as well as in lecture. Late homework will **not** be accepted except in the case of illness verified by a doctor's signature.

Projects: There will be two group projects during the semester.

Important Dates:

First class	September 3	
Midterm exam 1	Tuesday, October 8	*Subject to change*
Midterm exam 2	Tuesday, November 12	*Subject to change*
Thanksgiving break	November 28	
Last class	December 12	
Final Exam	December 20	1:30 – 3:30 PM

If you have a reason why you cannot attend class (religious holiday, official University business), see me before the exam! Only medical emergencies will be considered as excuses after the exams. If you miss an exam with a valid excuse, a makeup exam will be given.

Extra Help: I will be available at the end of each lecture to answer questions, or come to my office hours. Please seek help at the first sign of difficulties or confusion.

Notes: I will post .pdf versions of the lectures on the course web site after lectures.

Grading: Your grade will be based on the following:

Midterms	20%
Project #1	10%
Project #2	15%
Reading Assignments	10%
Homework	15%
Class Participation*	10%
Final Exam	20%

*Clickers are required and will be used *in part* to assign Participation grades.

Academic Integrity: The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://www.studenthonorcouncil.umd.edu/whatis.html.

Disabilities: If you have a documented disability and wish to discuss accommodations, please contact me as soon as possible.

Helpful tips:

1) **Read the assignments** *before* class and refresh yourself after.

2) **Do the homework**. There will be approximately 6 homework assignments. You may collaborate on homework assignments, but you will be responsible for producing your own work.

3) **Attend class**. Classes will be highly interactive with a mix of lecture, group activities, demonstrations, and discussion. Clickers will be used in part to measure class participation.

4) **Attend discussion sections** - Much of your project work will be done in the discussion sections.

5) **Contribute to the projects.** There will be major group projects assigned during this course. Participation in these projects is essential and will hopefully be enjoyable. Students will work together in groups for each project and will peer evaluate each other.

6) **Talk to your classmates**. Trying to explain something to someone else is often the best way for you to fully understand the concept.

7) **Ask questions in class**. There are no stupid questions – only ones you don't ask.

Tentative Schedule:

- Population and Growth
- Energy Concepts
- Thermodynamics
- Fossil Fuels
- Transportation
- Climate Change
- Renewable Energy
- Food
- Politics