

Physics 105

Fall 2017

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 issue facing our planet.

Specific objectives are:

- To understand the human impact on the global climate and the fundamental science of energy and energy usage in the world.
- 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 and Climate – Vision for the Future* by Michael B. McElroy ISBN-10: 0190490330 – available at campus bookstore or online.

Clickers: We will be using personal response devices – see [this link](#) to register your device. The preferred device is a TurningPoint RF-LCD, which can be purchased at the bookstore. You can also purchase used ones and register them to yourself. You may not use a phone app. These will be an important part of your grade so get one and bring to class.

Campus Policies

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics like:

- Academic integrity
- Student and instructor conduct
- Accessibility and accommodations
- Attendance and excused absences
- Grades and appeals
- Copyright and intellectual property

Please visit <http://www.ugst.umd.edu/courserelatedpolicies.html> for the Office of Undergraduate Studies' full list of campus-wide policies and follow up with me if you have questions.

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 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: PSC 0208 (PHYSICS CHAIR'S OFFICE)

Phone: (301) 405-5946 Email: rolston@umd.edu

Office hours: Tuesday after class (other times are fine with an email to set it up)

TA: tba

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. 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.

Discussion:

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

Section 0104 – Friday - 12:00pm- 12:50pm (MTH 0102)

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

Important Dates:

First class	August 29	
Midterm exam 1	Tuesday, October 3	
Midterm exam 2	Tuesday, November 7	
Thanksgiving break	November 22	
Last class	December 7	
Final Exam	December 18	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.

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 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:

This topic is about as current as it can get, so we will have a nimble and flexible schedule so that we can adapt to things happening during the semester.

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