

Phys 0087 Science and Society

Instructor:

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Practical Information:

class meetings: Tuesday and Thursday 2:50 - 4:05 synchronously via zoom

office hours: feel free to email me to set up a zoom meeting

grading policy: More details will be given in the first lecture. The final grade will be the best of

- (i) 10% assignments + 15% group tasks + 30% max(midterm 1, midterm2) + 45% final
- (ii) 10% assignments + 15% group tasks + 20% midterm 1 + 20% midterm2 + 35% final
- (iii) 10% assignments + 15% group tasks + 75% final

course text: Science and Society. Available at the bookstore or at [Amazon](#), or directly from [Springer](#).

Course Description:

This course examines the conceptual foundations of modern science with the goal of understanding how science affects our daily lives and our impact on the environment.

Course Objectives

Upon successful completion of this course the student will understand the genesis of the modern scientific worldview, be able to assess the quality of scientific studies, will be able to read and understand graphs, will understand the metric system, will understand the electromagnetic spectrum, will understand types of nuclear radiation and their health effects.

Course Content

Topics covered include

- 1 What is Science?
- 2 Doing Science (understanding medical studies)
- 3 Pseudoscience (bad science and how to recognize it)
- 4 Energy and Entropy (an introduction to the central idea of energy)
- 5 Electricity, Magnetism, and Light
- 6 Atom and Light (how light interacts with matter)
- 7 Climate
- 8 Nuclear Energy and Radiation
- 9 A Finite Planet (resource management)
- 10 Outlook (space travel and predictions)

We will discuss climate change, energy use, water management, population growth, and other topical issues. Case studies of good and bad science will be made. Specific physics principles covered will include, units, graphing, exponential growth, the atomic paradigm, energy, conservation laws, properties of light, and principles of quantum mechanics. Very little mathematics is required.

Readings and Assignments

Two to six individual assignments will be given during the term. In addition there will be 2-6 group assignments that will be done during class.

Disability Statement

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services, 216 William Pitt Union, (412) 648-7890/(412) 383-7355 (TTY), as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course. A comprehensive description of the services of that office can be obtained at www.drs.pitt.edu.