

SYLLABUS: SCIENCE IN SOCIETY

SCI 4300, 2 Credits, Fall 2008

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Office Hours: Wednesday, 2:30 - 4:00 p.m. (or by appointment)

Text: Easton, Thomas A., Taking Sides: Clashing views in Science, Technology, and Society, Eighth Edition, McGraw Hill, 2008.

Lecture: Monday / Wednesday, 1:30PM - 2:20PM, Business 322

Course Web Site: <http://www.physics.usu.edu/snively/4300/index.html>

1. What is this course?

Science plays a constant and critical role in our lives. New and evolving technologies, and enhanced understanding of our natural world, are some of the direct benefits. However, new controversies also arise – Questions of ethics, health and safety, socio-politics, and action vs. inaction. To help you understand and analyze current and future issues, it is necessary to explore the methodologies of science, and its roles in society. In this course, we will openly investigate the interactions of science and society, while exploring many current topics that you may have already encountered in courses and in daily life.

2. What should you expect from this course?

This course aims to expand your ability to think logically, coherently, thoroughly, and scientifically about important societal issues pertaining to science and technology. It is an opportunity to expand your critical thinking abilities, and to develop the tools and confidence to deal with new and occasionally controversial topics. We will focus on three important skills:

- A.** Seeing the interrelations between science and society.
- B.** Identifying the scientific claims relevant to particular societal issues.
- C.** Objectively evaluating the scientific claims in context.

COURSE FORMAT AND GRADING:

Your grade will be based upon the following:

1. Class Participation	15%
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Attendance	5%
Active Participation	10%

2. Short Papers (~5 topics, 2-3 pages each)	25%
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3. Individual Presentations	20%
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Presentation in Class	10%
Write-up	10%

4. Class Project (TBA)	10%
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5. Written Discussion of “Dilemmas”	10%
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6. Take-home Final Exam	20%
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100%

If a student has a disability that requires some accommodation by the instructor, the student must contact the instructor and document the disability through the Disability Resource Center. In cooperation with the Disability Resource Center, course material will be provided in alternative formats, such as large print, audio, diskette, or Braille.

REFERENCES AND RESOURCES:

There are many resources available to you that deal with issues of science and society. Perhaps the obvious starting point is the internet, with some caveats. As we well-know, not everything on the internet is unbiased, accurate, or even true. Try very hard to evaluate your sources, using the internet as a tool to find references to primary sources. For example, *Wikipedia* articles can be of exceptionally high quality – but can be tampered with, and should *never* be referenced directly.

In addition to internet resources, there are excellent paper sources in the Library newspapers, journals, and periodicals collections. For many current topics, it can be helpful to interview our local experts here at the University.

List of News Resources, Online and On-Paper (Many more out there!):

American Scientist	Newsweek
Audubon	New York Times Science Section
Bioscience	Physics Today
Chemistry and Engineering News	Popular Science
Christian Science Monitor	Science
Consumer's Report	Science News
Discover	Science of the Total Environment
Issues in Science and Technology	Time
National Geographic	U. S. News and World Report
Nature	World Watch

Places to Find New / Fun Stuff:

<http://news.google.com/>

<http://slashdot.org/>

INDIVIDUAL PRESENTATIONS:

The individual presentations offer a chance to get deeply involved in a topic of interest. That is, one that includes a strong base of scientific knowledge or technology that is relevant to, or raises an issue of concern to, society. Your presentations will be approximately 12-15 minutes long, plus 5 minutes additional for questions and discussion. They should be done formally, using your favorite presentation software package, or overhead transparency sheets. Additionally, a 5-7 page written formal version of the presentation is to be submitted. This paper will include citations in the body of the text ([*Author*, 1987] format), with a list of proper references at the end (the list does not count towards the 5-7 page limit). *The presentation will include:*

- 1. Introduction to the topic or issue.**
- 2. A clearly stated claim concerning the topic.** Preferably, the claim will advocate some societal or political action aimed at resolving the issue. You may or may not agree with the claim; it may be your own formulation or someone else's.
- 3. The relevant data and associated interpretation(s).** Give some thought to the form in which data are presented, and to the reliability of data.
- 4. Presentation of the societal concerns related to the topic,** and recognition of opposing points of view. Be as complete as possible.
- 5. Discussion of the claim in light of the data and relevant social issues.**
- 6. At the end of your presentation,** present to the class a *dilemma* related to your presentation that is to be answered in writing (by taking a side and defending it). For example, if your topic deals with the incineration of hazardous waste, the dilemma might be something like "Should Tooele County allow the construction of an incinerator to dispose of nerve gas? Why or why not?"

“Dilemmas”:

Each presenter will pose a *dilemma*; a question with two distinct sides related to his or her presentation. You are required to choose four of these for which to write a written response. Your answer must include suggestions for resolving the dilemma, and your reasons for your choice. You will hand in four written responses to be graded (10 points each) at the end of the student presentations. These responses should be between one half to one page long, single spaced, and typed.

SCIENCE IN SOCIETY TOPIC ANALYSIS:

In your individual presentations, as well as the short papers assigned for this class, it is necessary to analyze the topic in detail. Here are some questions and considerations that you should ask yourself as you do your research and prepare your presentation and / or papers (with Thanks to Dr. Peter Kolesar):

1. Begin to outline the relationship of the topic to: *Science, Technology, Environment, Law, Politics, Ethics, Religion, and Economics*.
2. Of what value to society is a public that is scientifically informed about this particular topic?
3. What are the *ramifications* of the topic on the local, national, and global scale with respect to the areas listed above?
4. What is the current *attitude* of the public toward the topic at the local, national, and global scale with respect to the areas listed above?
5. With respect to question 4 above, how sound are the scientific data that gave rise to the public attitude? Has the topic been sufficiently researched? Was the research objective? Was the research supported by a disinterested party? In what type of media has the research been published? Who stands to benefit, and how, depending on the solutions to the problem?
6. Are scientists pretty much in agreement about the topic under consideration with respect to cause and effect, seriousness, and best solutions? If not, what is the basis for disagreement?
7. What is the chronology of the topic? For example: Is global warming a uniquely modern problem, or did it exist a century ago? A thousand years ago? A million years? Is modern technology a major contributor?
8. Identify the basic science and technology relevant to the topic. Examine the relationships between the two. For example, did scientific discovery create new technology, or vice-versa?
9. What are the limits to problem-solving, scientific discovery, technology, application of technology, etc.?
10. Examine the past, present, and future impact of societal concerns on: scientific research, application of technology, problem-solving, and decision making.
11. Discuss what action should be taken by responsible citizens.
12. Use cost versus benefit analysis to critically examine your findings. Examine the two or three most obvious tradeoffs. Are economic considerations to be weighted? What costs are usually paid for what benefits? Are present benefits often obtained by future costs? Are material values given more considerations than other values?