The purpose of this course is to examine and assess the nature of science and technology, and their interactions with each other and with society, focusing especially on their influence on what humans value. As an introduction to science and technology studies (STS), it provides acquaintance with the major positions and schools in STS. The course employs a variety of perspectives and approaches, including the historical, philosophical, sociological, and quantitative. It is concerned with obtaining a broad overview of the diversity of thought about science and technology rather than a deep analysis of any one school or interpretation. The attempt to acquire a more sophisticated and comprehensive picture of science and technology is ultimately aimed at enabling a more critical and knowledgeable consideration of how social and individual values mold, and in turn are molded by, scientific and technological developments. To that end, the course concerns itself with questions in ethics, social responsibility, human nature, and public policy.

Class meetings (MWF 10:00 - 10:50 a.m.) primarily consist of discussion of issues and questions raised in the assigned reading.

Requirements: Class participation, 3 exercises, 2 papers (#1: 3-5 pp, #2: 5-7 pp), 2 hour exams, and a short quiz, each respectively worth approximately 20%, 20%, 30%, 28%, and 2% towards the final grade, which will be sensitive to active class participation [attendance, quality & frequency of interaction]

Textbooks: The required texts for the course are:

- Bronowski, J. Science and Human Values
- Collins/Pinch The Golem: …. Science
- Collins/Pinch The Golem at Large: ….Technology
- Kuhn, T. The Structure of Scientific Revolutions
- Teich, A. Technology and the Future [9th editions]
- Volti, R. Society and Technological Change [4th edition]
- Winner, L. The Whale and the Reactor

In addition, the following packet of items assigned as reading is available at cost [$9.00] in Bronfman 189 from Ms. Kate Fletcher, Administrative Assistant:

1. H. Bauer So-called "scientific method" (Sep. 10)
2. J. B. Conant There is no scientific method (Sep. 10)
3. Karl Popper Science: conjectures and refutations (Sep. 10)
4. M. Black Is Induction an acceptable scientific tool? (Sep. 10)
5. B. Brody Confirming…..the New Riddle of Induction (Sep. 10)
6. E. McMullin Reactions to the Logical Positivist… (Sep. 10)
7. Troxell/Snyder Causes and David Hume (Sep. 10)
SCHEDULE OF CLASS MEETINGS AND READINGS

1. Introduction, Orientation.

   1. Fri., Sept. 5  Science and technology studies (STS); component
disciplines and approaches. Interrelation of
science, technology, society, and values.
What questions does this approach answer?

Source of Values?

   2. Mon., Sept. 8  Creativity in art and science. Origins of scientific
ideas. Do scientists invent or discover? Does
science instill a higher moral sensitivity? What
human values are most consonant with science?
How might science contribute to ethics?
Bronowski, Chapters 1-3.

3. Philosophy of Science: Is there a "Scientific Method"? How do we know
what we know? What assumptions do we make
about the ultimate nature of reality?

   3. Wed., Sept. 10  What different types of scientific "method" are
there? What makes a science "science" -
Experiment? Observation? The (il)logic of "proof."
Falsification. The problem of induction. Cause. Bauer "So-called" 25-37; Conant "No Method" 206-7; Popper "Refutations" 81-86; Black "Induction" 154-161; Brody "New Riddle" 216-18; McMullin "Positivism" 229-237; Troxell/Snyder "Causes" 242-247


4. Sociology of Science - How is science structured socially? How did science change in moving from little science to Big Science? Is there much place left for the lone scientist?

5. Mon., Sept. 15 What are the norms and values of the scientific community? What social institutions embody or support science? What practices challenge established norms? [Lecture - discussion] Sayre "Making a Discovery" 124-131


5. The Structure of Scientific Revolutions: An Influential Model. Scientific Knowledge as Social Construction


7. Fri., Sept. 19 Kuhn, Preface, 1-110 (paradigm, normal science, anomalies, crisis, revolution)

8. Mon., Sept. 22 Kuhn, 111-210, (revolution; resolution, incommensurability, "progress," postscript)

6. Science - A Separate Culture?

EXERCISE #1: Read Gross and Levitt The Higher Superstition, 1-15; 71-106; 234-257, and write a one page position paper on it for discussion as a current example of the Two Cultures.

7. What do we really need to know about science and how it works?

10. Fri., Sept. 26  Case Studies I: Golem, Ch. 1-3

11. Mon., Sept. 29  Case Studies II: Golem, Ch. 4-7
8. Scientific Knowledge and Its Social Problems

   What is, has been, and should be the relationship
   between ethics and science? Can ethics survive
   modern science? In the light of what we think
   we know, how ought we to behave?
   **Excerpts on Ethics**

**IF Mountain Day on 3, 10, or 17, THEN redate through Mon 10/20**

13. Fri., Oct. 3  Ethical Issues. What about fraud in scientific
   research? Can scientific research be objective
   and unbiased? Is scientific knowledge neutral?
   **FIRST PAPER: Reporting Science to the Public**

9. Thinking about Technology

14. Mon., Oct. 6  What technology "is", how and why it changes
   and a brief social history of its development and
   diffusion.
   **Volti, Chapters 1-5 (3-85)**

15. Wed., Oct. 8  Different Ways to Think about Technology
   **Teich, 9th**: pp 1-45 [Marx, Pool, Weinberg, Berry
   Florman] plus **Postman and Hughes from 8th**.
   **Teich, 8th**: pp. 1-58 [Marx, Postman, Hughes,
   Weinberg, Berry, Florman] plus **Pool from 9th**.

16. Fri., Oct. 10  More Ways to Think about Technology
   **Teich 9th**: pp 47–68 [Mesthene, McDermott]
   **Teich 8th;**, pp 59-80 [Mesthene, McDermott]

---------------------------FALL READING PERIOD-------------------------------

10. Philosophy of Technology


Review and Consolidation

18. Fri., Oct 17  **Hour Exam**

11. What do we really need to know about technology? How technology really works?


20. Fri., Oct. 24  **The Golem at Large**: Ch. 5-7, Conclusion (93-155)
12. Communication

21. Mon., Oct. 27  
   Volti, Part 4 (pp 181-215)

12. Transformation of Work

   Volti, Part 3 (pp 129-175)  
   Teich 9th: Zuboff, Jenkins [268–275; 119–134]  
   Teich 8th: Zuboff, Jenkins [294-301; 121-136]

13. Biomedicine, Public Health, and Ethical Dilemmas

23. Fri., Oct. 31  
   What is all this health for? What limits ought there to be on biomedical technology, if any?  
   Teich 8th: Weinberg, Kass: [213-255]; plus Bush, Murray, and Groopman from 9th [196-208,225-7]  
   Teich 9th: Weinberg Bush, Murray, Kass, Groopman [185-227]  
   Morison, "Visions"  
   Volti, Ch. 7 (pp. 107-123)

24. Mon., Nov. 3  
   Public Health, Risk, and Medical Ethics  
   Continuing discussion; no reading assigned  
   SECOND PAPER: Technological Literacy

14. The Control of Technology

25. Wed., Nov. 5  
   Is Technology Autonomous? What can individuals, institutions, governments do?  
   Volti, Chs. 15-17, (pp 265-308)  
   Teich 8th: Sclove [pp. 103-120]  
   Teich 9th: Sclove [pp. 91-108]
26. Fri., Nov. 7  
Is there any hope in technology assessment?  
Teich 9th: Cerruzzi, [229-241] plus Kahn & Wiener,  
Brody, Coates et al, from 8th [171-189, 202-212]  
Teich 8th: Cerruzzi, Kahn and Wiener; Brody;  
Coates, Mahaffie, and Hines [169-212]

15. Appropriate Technology - The Lure of Decentralization

27. Mon., Nov. 10  
Is there a better way to integrate technology  
with society?  
Teich 9th: Schumacher, Goodman, Sandar, Wajcman  
[71-90, 109-118, 135-147]  
Teich 8th: Schumacher, Goodman, Wajcman  
[81-102; 137-149] plus Sandar fr, 9th [109-118]  
Exemplar from Kerala [Franke/Chasin]

Questioning Appropriate Technology and  
Decentralization  
Winner, Chs. 4,5 (61-97)  
EXERCISE #3 Due: Terms and Phrases in STS

16. Computer Technology

29. Fri., Nov. 14  
Revolution? or "Mythinformation"?  
Should the "computer society" be X-rated?  
Winner, Ch. 6 (98-117)  
Teich 9th: Lessig [258-267] plus Negroponte,  
Norman from 8th [303-336]  
Teich 8th: Negroponte, Norman [303-336] plus  
Lessig from 9th [258-267]  
Coyle, "ACCESS," Postman, "Informing"

30. Mon., Nov. 17  
Computers, Ethics and Privacy  
Teich 9th: Morrison and Forester [232-247]  
Teich 8th: Morrison and Forester [259-275]  
Examples and Scenarios [from Packet, "et al"]
17. The Fate of Nature in a Technological World

31. Wed., Nov. 19  Is Western technology antithetical to nature?
   Winner, Ch. 7 (121-137)
   White, "Historical Roots of Ecological Crisis"
   Volti, Ch. 6 (pp. 88-104)

32. Fri., Nov. 21  Are Deep Ecology, Recycling, and
   Environmentalism Overdone?
   Tierney, "Recycling"
   Gross/Levitt, 149-178; 227-228; 231-233

18. Review and Consolidation - Technology

33. Mon., Nov. 24  Hour Exam

---------------------------------THANKSGIVING-----------------------------------


34. Mon., Dec. 2  Winner, Ch. 8 (138-154)
   Teich 9th: Lovins & Lovins, Martin, Joy, Brown &
   Duguid [165-183; 295-322]
   Teich 8th: only the above from 9th

19. Science, Technology, and Human Values - or is it Embarrassment?
   Technology and Politics, Now and Future

35. Wed., Dec. 4  Winner, Ch. 9 (155-163), Ch. 10 (164-178)
   Looking at STS.

20. STS: Retrospect and Prospect

36. Fri., Dec. 6  Quiz. Review; Suggestions; SCES