

# UNIVERSITY OF TEXAS AT AUSTIN PROGRAM

## *Science, Technology, and the Responsible Citizen*

### The University of Texas at Austin

June 24-August 4, 2007

**Faculty:** Lorenzo Alvisi, Department of Computer Sciences, and Irene Eibenstein-Alvisi, Department of French and Italian, both of The University of Texas at Austin

**Factota:** Matthew Schmitz, Princeton University, and Mychalena DeBehnke, Northern Illinois University

#### Week 1

- M 6/25
- Introductions and presentation of the program.
  - “Global warming is not a crisis” from: Intelligence<sup>2</sup> US, a venue for Oxford-style debates from an initiative of the Rosenkrantz foundation. The debates take place at the ASIA society in New York City and are distributed for download by National Public Radio.
- T 6/26
- Genesis 1.1-3.24
  - The Epic of Gilgamesh
  - Science, truth and facts (Chalmers, What is this thing called Science?, Chapters 1,2)
- W 6/27
- Hesiod, Theogony, lines 507-616
  - Hesiod, Works and Days, lines 47-106
  - The nature of experiments (Chalmers, What is this thing called Science?, Chapter 3)
- Th 6/28
- Dante, Inferno XXVI
  - Alfred Tennyson, Ulysses
  - P. Levi, Survival in Auschwitz, (Chapter 11: The Canto of Ulysses)
  - The Inductive Method and its limitations (Chalmers, What is this thing called Science?, Chapter 4).
- F 6/29
- “We'll build our house, and chop our wood, And make our garden grow.”
- Video: Leonard Bernstein, Candide. (Great Performances, 2005).

## Week 2

- M 7/2
- Aeschylus, Prometheus Bound
  - Introduction to Falsificationism (Chalmers, What is this thing called Science?, Chapter 5)
  - K. Popper, Conjectures and Refutations, (London: Routledge and Kegan Paul, 1963) pp. 33-39.
- T 7/3
- Aeschylus, Prometheus Bound
  - Intelligent Design and Evolution: can they be falsified? Individual research and in-class discussion
- W 7/4
- NO CLASS
- Th 7/5
- Science or Pseudoscience? The problem of demarcation
- Video: NOVA: Netwon's Dark Secrets (2003)
  - T. S. Kuhn, Logic of Discovery or Psychology of Research? (from I. Lakatos and A. Musgrave, eds., Criticism and the Growth of Knowledge, Cambridge 1970, pp. 4-10)
  - P. R. Thagard, Why Astrology is a Pseudoscience, (from P. Asquith and I. Hacking, eds. Proceedings of the Philosophy of Science Association Vol. 1, 1978, pp. 223-234)
- F 7/6
- Johann Wolfgang von Goethe: Faust, Part I
  - Sophisticated Falsificationism and the Limits of Falsificationism (Chalmers, What is this thing called Science?, Chapters 6 & 7)

## Week 3

- M 7/9
- Johann Wolfgang von Goethe: Faust, Part I
  - W.A. Mozart, Requiem in D minor, KV 626 "Dies Irae"
  - Video: G. Verdi, Messa da Requiem, "Dies Irae" (Karajan, Orchestra of La Scala)
- T 7/10
- Video: Opera: Arrigo Boito, Mefistofele (excerpts) (San Francisco Opera, 1989)
  - Video: Opera: Hector Berlioz, La Damnation de Faust (excerpts) (Salzburg Festival, 1999)
  - Theories as Structures: Kuhn's Paradigms (Chalmers, What is this thing called Science?, Chapter 8)
  - T.S. Kuhn, The Structure of Scientific Revolutions, (2<sup>nd</sup> Edition, Chicago University Press, 1970, pp. 92-110)
  - T.S. Kuhn, The Essential Tension: Selected Studies in Scientific Tradition and Change, (Chicago University Press, 1977, pp. 320-339)

- W 7/11
- Queen, Bohemian Rhapsody (excerpt)
  - Bertolt Brecht, Galileo (1947)
- Additional assigned material:
- Video: Joseph Losey, Galileo (from Brecht's 1947 play)
  - Video: NOVA: Galileo's Battle for the Heavens (2002)
- Th 7/12
- E. McMullin, Rationality and Paradigm Change in Science (from P. Horvich, ed., World Changes: Thomas Kuhn and the Nature of Science, MIT Press, 1993, pp. 55-78)
  - Theories as Structures: Lakatos's Research Programs (Chalmers, What is this thing called Science?, Chapter 9)
- F 7/13
- Video: Copenhagen by Howard Davies (from Michel's Frayn's 1998 play)

#### **Week 4**

- M 7/16
- F. Dürrenmatt, The Physicists (1960).
  - Feyerabend's Anarchistic Theory of Science (Chalmers, What is this thing called Science?, Chapter 10)
  - P.K. Feyerabend, How to Defend Society Against Science, Radical Philosophy n.11, Summer 1975.
  - Methodical Changes in Method (Chalmers, What is this thing called Science?, Chapter 11)
- Suggested reading:
- P.K. Feyerabend, Consolations for the Specialist, (from I. Lakatos and A. Musgrave, eds., Criticism and the Growth of Knowledge, Cambridge 1970, pp. 197-230).
- T 7/17
- Mary Wollenstonecraft Shelley, Frankenstein, vol. I
  - J. Watkins, Against Normal Science (from I. Lakatos and A. Musgrave, eds., Criticism and the Growth of Knowledge, Cambridge 1970, pp. 25-37).
  - K. Popper, Normal Science and its Dangers, (from I. Lakatos and A. Musgrave, eds., Criticism and the Growth of Knowledge, Cambridge 1970, pp. 51-58).
- W 7/18
- Mary Wollenstonecraft Shelley, Frankenstein, vol. II
  - Video: NOVA: Einstein's Great Idea.
- Th 7/19
- Mary Wollenstonecraft Shelley, Frankenstein, vol. III
  - The Bayesian Approach (Chalmers, What is this thing called Science?, Chapter 12).

- F 7/20
- Wesley C. Salmon, Rationality and Objectivity in Science or Tom Kuhn Meets Tom Bayes, as in C. W. Savage (ed.) Scientific Theories, (Minnesota Studies in the Philosophy of Science, Vol. 14).
  - Clark Glymour, Why I Am Not A Bayesian, (from Theory and Evidence, pp. 63 – 93).
  - Video: The Atomic Café, directed by Jayne Loader and Kevin and Pierce Rafferty, 1982.

## Week 5

- M 7/23
- The New Experimentalism (Chalmers, What is this thing called Science?, Chapter 13).
  - Bill Joy, Why the Future Does Not Need Us, (Wired magazine, April 2000).
  - Bill Joy, A Call for Early Intervention, (interview on ACM Ubiquity IT Magazine, Volume 1, Issue 14, May 2000).
  - Freeman Dyson, The Future Needs Us! (The New York Review of Books, Volume 50, No. 2, February 13 2003).
  - R. Smalley, Of Chemistry, Love, and Nanorobots, (Scientific American, September 2001).
  - Nanotechnology: Drexler and Smalley make the case for and against “molecular assemblers”, Chemical and Engineering News, CENEAR Volume 81, No. 48, pp. 37-42).
- T 7/24
- Video: Rashomon by Akira Kurosawa (1950)
  - James D. Watson: The Double Helix
- W 7/25
- James D. Watson: The Double Helix,
  - Interviews with Francis Crick and James D. Watson, BBC Archives  
(<http://www.bbc.co.uk/bbcfour/audiointerviews/profilepages/crickwatson1.shtml>)
  - Video: NOVA: Secret of Photo 51
- Th 7/26
- Student-led Forum:
    - Gender and Aptitude to Math and Science
    - Human-Animal Chimeras
- F 7/27
- Student-led Forum:
    - The Future of Google
    - Genetically Modified Organisms

## Week 6

- M 7/30
- Sophocles, Oedipus Rex

- T 7/31
- Student-led Forum:
    - E-books
    - Climate intervention
- W 8/1
- Sophocles, Oedipus Rex
  - An impossibility result: The two generals problem
  - Reasoning about knowledge: The muddy children problem and Kripke Structures.
- Th 8/2
- Undecidability and the Halting Problem.
  - Video: L. Bernstein, The Unanswered Question. Six Talks at Harvard: Analysis of Stravinsky's Oedipus Rex (1976).
  - Video: Opera: I. Stravinsky, Oedipus Rex directed by Julie Taymor, conducted by Seiji Ozawa (1993).
  - Why Should the World Obey Laws (Chalmers, What is This Thing Called Science?, Chapter 14).
  - A. J. Ayer, What is a Law of Nature?, (in Brody, B.A. (ed.) Readings in the Philosophy of Science, Prentice Hall, 1970, pp. 39-54.
- Additional Material:
- Video: Koyaanisqatsi: Life out of Balance, by Goddfrey Reggio, 1983.
- F 8/3
- Students' performance: Sophocles, Oedipus Rex
  - "This I Believe"

### **Books:**

Anonymous. The Epic of Gilgamesh. Trans. Andrew George. Penguin Epics

Aeschylus. Prometheus Bound. Trans. James Scully and C. John Herington. Oxford University Press.

Bertolt Brecht. Galileo. Trans. Charles Laughton. Grove Press.

Alan Chalmers. What Is This Thing Called Science? Hackett Publishing Company.

Johann Wolfgang von Goethe. Faust, Part I. Trans. David Constantine. Penguin Classics.

Friederich Dürrenmatt, The Physicists, Grove Press.

Tracy Kidder. The Soul of a New Machine. Little, Brown and Company.

Sophocles. Oedipus Rex. Dover Thrift Edition.

James D. Watson. The Double Helix. Touchstone.

Mary Wollenstonecraft Shelley. Frankenstein. Norton Critical Edition.