

# THE NUCLEAR REVOLUTION

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Tuesdays and Thursdays 12:35 – 1:50 P.M., Thornton Hall 326

(Prerequisite: English 214 or equivalent)

This course will examine scientific and humanistic aspects of the Nuclear Revolution. We shall present the physics and engineering associated with nuclear weapons, nuclear reactors, and nuclear accidents; and we shall explore the history of the Nuclear Age and its relationships to philosophy, literature, art, politics and law.

Re: the **Scientific Aspects**: Our aim is to promote an understanding of the threat of a nuclear holocaust, the promise and danger of nuclear power, and the problems of international control over nuclear energy. Topics will include the effects of a nuclear war, nuclear weapon proliferation, nuclear terrorism, reactor safety, waste storage, radioactive fallout, and radiation effects on humans.

Re: the **Philosophical Aspects**: We will examine the relations between scientific and humanistic ways of understanding the world and acting in it. We will explore questions relating to the moral responsibilities of scientists and non-scientists in an age in which scientific knowledge makes possible the destruction of millions of human lives in a few hours. We will explore nuclear deterrence and nuclear warfare beginning in 1945 in light of the much older philosophical theories about the “just war.” And we will look at the moral, political, philosophical, and legal problems and possibilities of controlling or eliminating nuclear weapons, including such international efforts as the nuclear non-proliferation, anti-ballistic missile, and comprehensive test-ban treaties.

Re: the **NEXA Aspects**: Through reading and discussing Jacob Bronowski, *Science and Human Values*, selections from *Assessing the Nuclear Age* (Ackland and McGuire, editors), selections from Thomas Kuhn, *The Structure of Scientific Revolutions*, “Disciplinary Interdependencies” (Shapiro and Silver), and Michael Frayn’s play *Copenhagen*, we will strive to gain an understanding of how the Sciences and the Humanities can be integrated in the exploration (and, perhaps, in a resolution) of crucial scientific-philosophical-political-ethical-artistic issues.

## **REQUIRED TEXTS**

Jacob Bronowski, *Science and Human Values*, revised edition with a new dialogue, “The Abacus and the Rose” (New York: Harper & Row / Perennial Library, 1965)

Michael Frayn, *Copenhagen* (New York: Random House, Inc. / Anchor Books, 2000)

Thomas S. Kuhn, *The Structure of Scientific Revolutions* (3rd edition; Chicago: The University of Chicago Press, 1996)

Jonathan Schell, *The Gift of Time: The Case for Abolishing Nuclear Weapons Now* (New York: Henry Holt and Company / Metropolitan Books, 1998)

Michael B. Stoff, Jonathan F. Fanton, and R. Hal Williams, eds., *The Manhattan Project: A Documentary Introduction to the Atomic Age* (New York: The McGraw-Hill Companies, Inc., 2000)

NEXA 340 Course Reader: selected works from

David Rittenhous Inglis, *Nuclear Energy – Its Physics and Its Social Challenge* (Reading, Massachusetts: Addison-Wesley Publishing Company, 1973)

James C. Warf, *All Things Nuclear* (Los Angeles: Southern California Federation of Scientists, 1989)

Len Acklund and Steven McGuire, editors, *Assessing the Nuclear Age* (Chicago: Educational Foundation for Nuclear Science, 1986)

Charles Shapiro and Laura M. Silver, “Disciplinary Interdependencies,” *The Humanities Journal*, vol. XI (1979)

## **BASES FOR GRADE:**

Midterm Examination 30 %

Project and Presentation 30 %

Final Examination 30 %

Class Participation 10 %