

NE 24, Section 2, Fall 2004

The Scientists of the Manhattan Project, their Contributions to President Eisenhower's Atoms for Peace Initiative and their Lasting Legacy to Nuclear Power in the 21st Century

Schedule: F11:00-12:00, 3105 Etcheverry Hall

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Course website: <http://iron.nuc.berkeley.edu/~bdwirth/Public/NE24/ne24.html>

Course description: The discovery of the neutron in 1932 by James Chadwick, the 1932 experiment by John Cockroft and Ernest Walton that confirmed Albert Einstein's postulate from the theory of relativity about the equivalence between mass and energy ($E=mc^2$), and the subsequent discovery of fission in 1938 revolutionized atomic and nuclear physics. During World War II, the United States established The Manhattan Project, which brought together many of the world's preeminent scientists and engineers under the leadership of J. Robert Oppenheimer with the goal of building a new and more explosive weapon based on these discoveries. The world entered the nuclear age with the explosion of the atomic bomb at Trinity, N.M. on 16 July 1945 and less than a decade later, U.S. President Dwight D. Eisenhower provided his vision for the peaceful use of atomic energy in a speech to the United Nation's on December 8, 1953 entitled, 'Atoms for Peace'.

This course will cover the history of the scientists and engineers who participated in the Manhattan Project and their contributions to nuclear science and technology, within the context of President Eisenhower's 1953 address and nuclear power in the 21st Century. Students in the course will be expected to perform a research report on an individual scientist or engineer from the Manhattan project and his/her contributions to nuclear energy.

Grading: Satisfactory or Unsatisfactory

Term Project (Oral presentation and written report): 100%

Textbooks: Richard Rhodes "The making of the atomic bomb", Touchstone, NY, 1988.

Stephane Groueff, "Manhattan Project: The untold story of the making of the atomic bomb", iUniverse, Inc., NE, 2000.

References:

- American Institute of Physics, Moments of Discovery Website, "The Discovery of Fission", <http://www.aip.org/history/mod/fission/fission1/01.html>
- U.S. Department of Energy, Office of Environmental Management, "Nuclear Age Timeline", <http://web.em.doe.gov/timeline/>
- Atomic Archive, "Timeline of the Nuclear Age", <http://www.atomicarchive.com/Timeline/Timeline.shtml>
- ALSOS Digital Library for Nuclear Issues, "Historical and Scientific Overview of the Atomic Age", <http://alsos.wlu.edu/>

NE 24 - (Tentative) Course Outline

| Date | Discussion topic |
|---------------|---|
| Sept 3, 2004 | Introduction and class objectives |
| Sept 10, 2004 | NO CLASS |
| Sept 17, 2004 | Scientific discovery in the atomic age |
| Sept 24, 2004 | Scientific discovery in the atomic age |
| Oct 1, 2004 | Guest lecture (Professor Hoffman), Glenn Seaborg |
| Oct 8, 2004 | Manhattan Project Overview |
| Oct 15, 2004 | Chicago Pile, Enrico Fermi and Eugene Wigner |
| Oct 22, 2004 | Engineering Challenges in the Manhattan Project |
| Oct 29, 2004 | President Eisenhower's "Atoms for Peace" speech |
| Nov 5, 2004 | Student presentations |
| Nov 12, 2004 | Student presentations |
| Nov 19, 2004 | Student presentations |
| Nov 26, 2004 | Thanksgiving holiday, NO CLASS |
| Dec 3, 2004 | Student presentations |
| Dec 10, 2004 | Student presentations |

Possible term projects:

- Admiral Rickover and the development of Naval Reactors
- Earnest Lawrence and the development of the cyclotron
- Atomic Energy Commission creation and history
- Edward Teller and the "Little Red Schoolhouse" workshop, 1956 (safe reactor designs)
- Oak Ridge National Laboratory, creation and legacy
- ...