Course Summary  No single technology has more profoundly affected human self-understanding--or had greater existential implications--than the Atomic Bomb. Technically realized in 1945, the bomb was built as a weapon of war, but soon came to be viewed as an instrument of suicide: for the first time in history, humans possessed the means of self-annihilation. As this fact ramified through science, politics, and culture--and as the development of thermonuclear weapons made the prospect of nuclear doomsday petrifyingly plausible--politicians grappled with threat of mutual assured destruction, film-makers delved into the moral and existential anxieties generated, and scientists recognized the implications of fall-out from weapons testing and the legacies of nuclear waste for the global environment and human health. In this class, we will examine the complex inter-relationships of the technical development of nuclear weaponry, the cultural manifestation of atomic angst, the environmental and health consequences of nuclear fall-out and nuclear industries, and the permanent legacy of nuclear waste.

Course goals  By now you should be familiar with the goals of the CAT sequence. Like all CAT courses, this course is designed to explore the interactions between culture, art and technology, and, in particular, how human beings use art and culture to address problems, including those of their own making. (The atomic bomb was, of course, a particularly acute technological problem of our own making, and it fostered a unique cultural response in the form of 1950s-era science fictions film.) The CAT sequence is also intended to help you learn how to take an interdisciplinary approach to complex issues. This includes enabling you to learn to read more acutely, gain an understanding of how and why scholars in different fields formulate questions and problems as they do, and appreciating the inquiry-driven nature of scholarly work.

Required Reading
There are four required books, on sale at the UCSD bookstore. Additional required readings will be posted as electronic reserves at Geisel Library. Required films will be placed on reserve in the Geisel Film and Video Library.

The required books are:
- *The Making of the Atomic Bomb* by Richard Rhodes
- *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age* by Paul Boyer
- *Hiroshima* by John Hersey
- *A World Destroyed* by Martin J. Sherwin

**Exams and Assignments**
The course grade will be based on one mid-term, one final, two papers, a final project, and class attendance and section participation. The exams will be a mix of short-answers (not multiple choice) and essays. The short papers will be defined questions, based on the class lectures, films, and assigned readings (4-5 pages).

The final project will be a museum display on technological anxiety. You will be asked to produce a poster board display based on the theme “How I learned to stop worrying and love _______.“ where ____ is a technology from the past, other than the atomic bomb, that created anxiety and/or existential angst. Making good use of visual images, your display should explore how and why this technology worried people, what mechanisms, if any, were emplaced to control it, and how the society involved came to terms with it, for better or worse. Each display must be accompanied by a short pamphlet (for example, one-page folded into thirds, as you might find in some museums) that helps to explain or amplify the visual arguments in the poster-board. Our presumption will be that most students will do an individual project, but students wishing to work in pairs or groups may do so with prior approval. Media other than poster board may also be used with prior approval.

The grading break-down is as follows:
- Attendance and section participation 15%
- Paper #1 15%
- Paper #2 20%
- Midterm Exam 15%
- Final Exam 15%
- Project 20%

**Attendance and late and missed papers**
Attendance is required at all lectures, including films and guest lectures, and sections. Following core program guidelines, late papers will be docked 1/3 of a letter grade for each day late. Make-up exams must be arranged as soon as possible after injury, illness, or family emergency. For further details, please refer the separate handout on core sequence goals and guidelines.
THE COURSE: LECTURES AND ASSIGNMENTS

PART I. Atomic Technology
Where did the atomic bomb come from? What discoveries and innovations made scientists believe that an atomic bomb was not only possible, but that German scientists might already be building one? Why did the US government decide to listen to a bunch of foreign-born theoretical physicists to launch the largest technological initiative in US history?

4/4 Atomic science and the discovery of nuclear fission
Atomic science in the 1920s. The problem of element 93. Hahn, Meitner and Strassman discover nuclear fission. Neils Bohr and others realize what it means, while the Nazis drive Jewish physicists from Europe.
Reading: Rhodes, Atomic Bomb, 198-275.

4/6 From scientific theory to political problem
Reading: Kevles, Excerpt from The Physicists, pp. 287-323 [electronic reserve]

4/11 The decision to build an atomic bomb
British-American discussions. The MAUD report. Enrico Fermi creates nuclear fission and the University of Chicago, Conant and Bush become convinced. FDR agrees.

4/13 An atomic industry: Los Alamos, Oak Ridge, and Hanford
The Manhattan Project begins. The design of the bomb. Parallel development. The production of enriched uranium and plutonium. Two different bomb designs.
Reading: Rhodes, Atomic Bomb, 522-614.

First writing assignment: due in class Tuesday 4/18
Albert Einstein once said that his 1939 letter to Franklin Delano Roosevelt was the greatest regret of his life. Drawing on class lectures and the assigned reading, write a thoughtful essay reassuring Einstein. (Note: I do not want you to write about whether the bomb was a good or bad thing, but rather about how to understand the historical significance of the Einstein letter.) Suggested length: 4-5 pages.

4/18 Trinity
DVD in Class: “The Day after Trinity” (88 minutes)
Part II. Atomic Politics
In August 1945, atomic bombs were dropped on the Japanese cities of Hiroshima and Nagasaki. Some 200,000 persons perished, mostly civilians. A week later, the war ended. It was easy to presume a causal link—the bombing caused the Japanese to surrender—and this was the story Americans were later told. No doubt the bombings contributed to the Japanese decision, but Americans were also told that the bombing was necessary to end the war. Most historians now have a different view: that the bombings were not so much the last event of World War II, but the first event of the Cold War. Even at the time, many people questioned the morality of vaporizing civilians, leading the US government to attempt the transmogrification of the A-bomb from a weapon of mass destruction to an instrument of peace.

4/20 The bombings of Hiroshima and Nagasaki.
Reading: John Hersey: Hiroshima
Boyer, Bomb’s Early Light, pp. 3-45

Evening Film: Black Rain (123 minutes)

4/25 The decision to drop the bomb.
Was the bomb necessary to end the war? Historians say that there were three options on the table to end the war in the summer of 1945: 1) wait for a Russian invasion, to force the Japanese to give up. 2) clarify the surrender terms, to assure the Japanese they could keep their emperor, or 3) use the atomic bomb. Historical evidence suggests that the later option was chosen in large part because Harry Truman felt that it would allow him to “dictate our terms” to the Russians.
Reading: Sherwin, World Destroyed, pp. 67-140.

4/27 The Decision (continued)
DVD in class: Peter Jennings, Hiroshima: Why the Bomb was Dropped
Reading: Sherwin, World Destroyed, pp. 141-192.

5/2 The Construction of an American myth
After the war, Harry Truman told the American people that the bomb was dropped to prevent a land invasion and save American lives—perhaps as many as a million. But historical evidence indicates that the figure of lives saved was, in fact, made up after the fact.
Reading: Sherwin, World Destroyed, pp. 193-238.
Gar Alperovitz, Excerpt from The Decision to Use the Atomic Bomb, pp. 437-457. [electronic reserve]

5/4 The Enola Gay affair
Why is it still so hard to talk about the bombings of Hiroshima and Nagasaki? Are we still in denial?

Guest lecture: Laura Harkewicz, Ph.D. candidate in History.
Reading: Paul Boyer, Excerpt from *Fallout*, pp. 246-268. [electronic reserve]

**TAKE HOME MID-TERM EXAM, due in class 5/9**

**Part III   Atomic Culture**

After Truman, Stimson and others constructed the official story of why the bomb was required to end the war, the U.S. government attempted to prove to the world that were had been right in our efforts, because nuclear power could be put to good cause. As the U.S. developed a civilian nuclear power program, weapons tests continued, the H-bomb was built, and the arms race was on. Meanwhile, ordinary people began to feel more and more anxious as to where this would all lead, and the basic question—were we right or wrong in our actions—has still never been resolved.

5/9 The bomb, transmogified

Since 1945, scientists had argued that the bomb demanded world governance, and the sharing of atomic secrets as the best means to avoid a costly arms race. Eisenhower rejected the scientists' view, and launched "Atoms for peace" to develop civilian nuclear power, and promoted civil defense--just in case.


5/11 Nuclear tests and nuclear fear

From 1945 to 1992, the U.S. government conducted over 1000 official tests of nuclear weapons. Before 1963, most of these were in the open air, and "fallout" became a household word as radionuclides were found in Greenland and Antarctica. Both scientists and the public worried, but the US government continued to assure the American people that everything was alright.

Reading: Boyer *Bomb's Early Light*, 82-92.
Excerpts from Spencer Weart, *Nuclear Fear*, 199-214 [electronic reserves]

5/16 The super-bomb

As the proposals for world government were rejected, the U.S. and the Soviet governments continued to build and test more weapons, beginning the development of what would ultimately become a stockpile of many tens of thousands of warheads, and both sides decided to build the ultimate weapon, the "Super", also known as the hydrogen bomb.


5/18 And now we can destroy the whole world....
Dr Strangelove has been billed as the only movie that makes you laugh at the end of the world.

Film in class: Dr Strangelove (93 minutes)
Reading: Excerpt from Paul Boyer, Fallout, pp. 95-102, and Weart, Nuclear Fear, 215-240 [electronic reserve].

5/23 Fear, fall-out and science fiction
Science Fiction exploded as an artistic genre in the 1950s, playing on the evidence of genetic damage in Hiroshima and Nagasaki survivors revealed by the work of the U.S. Atomic Bomb Casualty Commission, and fears of the end of the world. Meanwhile, the U.S. government assured the public that they had nothing to fear.

Film in class: The Incredible Shrinking Man (81 minutes).

Evening Film: The Atomic Café (92 minutes).
[No additional reading]

5/25 Did arms control work?
In the late 1960s and 1970s, atomic anxiety receded, as the limited test ban treaty pushed nuclear tests underground and out of sight, and as the U.S. and U.S.S.R. settled into the “MAD” truce (“Mutual Assured Destruction”) and a sequence of arms control talks aimed at ensuring that each side knew exactly what the other was up to. Did this work? After all, we are still here to ask this question...

Guest lecture: Herbert York, former Chancellor of UCSD and US Ambassador to the Comprehensive Test Ban Negotiations
Reading: to be announced.

Second writing assignment: due in class Tuesday 5/30
“Golden Age” of science fiction films, such as Them! (1954), Tarantula (1955), and Godzilla: King of the Monsters (1954) built on atomic fears of radiation and mutation; while other classics such as Five (1951), The Day the Earth Caught Fire (1961), The Day the Earth Stood Still (1951), and The Day the World Ended (1956) imagined—obviously—the end of the world. Choose two additional films from the list provided and watch them. Then, taking into consideration the three assigned films you have already watched (Strangelove, Atomic Café, and Shrinking Man), as well as the assigned readings, write a thoughtful essay on film as a medium for exploring terrain that our government would have rather left unexplored. Suggested length: 5-7 pages.

5/30 Nuclear fears, revisited
In the 1980s, anxieties became resurgent, as President Ronald Reagan re-invigorated American weapons development and proposed his Strategic Defense Initiative, which potentially threatened the balance of power/terror that MAD
represented. Once more, filmmakers took up the question, this time in a widely discussed made-for-television movie, which once again stressed that no one, not even in middle America, was safe.

DVD in class: The Day After (2 hours)
Reading: Boyer: Bomb’s Early Light, pp 352-367.

Part IV Atomic Legacies
The Cold War is over. The United States no longer tests nuclear weapons, but only “stewards” its stockpile. The Soviet Union no longer exists, and many weapons have been dismantled, their highly enriched uranium fuel “downblended” for use in American civilian nuclear power plants. Yet, we live with various legacies—political, social, medical, and environmental. We close this class with a consideration of the ways in which the past is never quite past, but continually unfolding into the future.

6/1 A radioactive world: Health legacies of the bomb
There are many victims of the bomb who never set foot in Hiroshima or Nagasaki. Only recently has the U.S. government acknowledged this, and only recently have scholars managed to estimate how many excess cancers and other medical ailments can be traced to the atomic age.

6/6 Plutonium is forever
We live now without bomb tests, but the U.S. government maintains a “stockpile” stewardship program to ensure that our weapons will still work, should we need them. In addition, our grandchildren, and their grandchildren, and their grandchildren, will live with the permanent legacy of nuclear waste.

6/8 CONCLUDING LECTURE

Term Project due Monday June 12
Final Exam as scheduled by the University

List of films for writing assignment #2
Choose any two to watch on your own time and use for discussing in your essay. For summaries of each film, go to http://www.imdb.com/
Films dealing with mutant creatures and monsters
The Thing from Another World (1951)
The Beast from 20,000 fathoms (1953)
Them! (1954)
Tarantula (1955)
Godzilla: King of the Monsters (1956) or its Japanese original, Gojira (1954)
The Incredible Shrinking Man (1957)
The Amazing Colossal Man (1957) and its sequel, The War of the Colossal Beast (1958)
The Most Dangerous Man Alive (1961)
The Beast of Yucca Flats (1961)

Films dealing with deadly invaders
It came from outer space (1953)
The Man from Planet X (1951)
The Invasion of the Body Snatchers (1956)

Films dealing with nuclear attacks (real or mistaken) and the end of the world
When Worlds Collide (1951)
Five (1951)
War of the Worlds (1953)
The Day the Earth Stood Still (1951)
The Day the World Ended (1956)
The Day the Earth Caught Fire (1961)
On the Beach (1959)
Voyage to the Bottom of the Sea (1961)
Ladybug, Ladybug (1963)
Fail-Safe (1964)