

Department of Nuclear Engineering, University of California at Berkeley

**Nuclear Engineering 24, Section 1**  
**Society, Environment, and Nuclear Power**

Monday 3:00-4:00, 83 Dwinelle Hall (1 unit, LG)  
CCN: 64003

**Instructor:** Prof. Joonhong Ahn, 4157 Etcheverry Hall, 642-5107, ahn@nuc.berkeley.edu  
**Office Hours:** 1-3 pm, Wednesday

**Course Objectives:** Lectures and discussions will be made on societal aspects of nuclear power utilization, for such topics as environmental impacts and safety of geologic disposal for radioactive wastes, development of societal agreement, and political, institutional, and historical insights on nuclear power utilization. Keynote lectures by the instructor and invited speakers from outside will be given. Students will select a topic of interest, and contribute to class discussions.

Week	Day	Contents
1	1/28	Introduction; Class organization; General overview of nuclear technology
2	2/4	(Topic 1) Nuclear technology and developing countries by Prof. Joonhong Ahn
3	2/11	(Topic 2) Low level radioactive waste issue in California and US by Dr. Alan Pasternak, California Radioactive Materials Management Forum
4	2/18	(Holiday)
5	2/25	(Topic 3) Yucca mountain repository by Dr. Bob Budnitz, Lawrence Berkeley National Laboratory
6	3/3	(Topic 4) A historian's view on nuclear technologies by Prof. Cathryn Carson, History Department, UCB
7	3/10	(Topic 5) Societal decision making and waste issues by Mr. Tom Isaacs, Lawrence Livermore National Laboratory
8	3/17	(Topic 6) Nuclear engineering and engineering ethics by Prof. William E. Kastenberg, Department of Nuclear Engineering, UCB
9	3/24	(Spring Recess)
10	3/31	Presentations by 4 students (Topic 1)
11	4/7	Presentations by 4 students (Topic 2)
12	4/14	Presentations by 4 students (Topic 3)
13	4/21	Presentations by 4 students (Topic 4)
14	4/28	Presentations by 4 students (Topic 5)
15	5/5	Presentations by 5 students (Topic 6)
16	5/12	Concluding remarks and discussions by Prof. Ahn and participating students

- Each invited lecture focuses an interesting topic in socio-technological and environmental issues in nuclear technology applications for about 35 minutes, followed by a Q&A session.
- Students will choose one topic for further self-studies. Each lecturer will introduce reading materials. Students can study those for their self-studies, or they can find other literatures by themselves.
- Based on their self-studies, they will prepare presentations for each topic. They prepare presentations individually. Other students will participate in discussions after these presentations.

Grading: Attendance (1/3); Participation in class discussions (1/3); Presentation (1/3)

Presentation will be graded on (1) Accuracy (Are the basic facts correctly presented?); (2) Organization (Are the objectives and conclusions succinct?); (3) Visual aids (Quality of presentation materials); (4) Response to questions and comments; (5) Overall presentation quality.

Joonhong Ahn is Professor of Nuclear Engineering at UC Berkeley, where he has taught since 1995. He holds a Ph.D. from UC Berkeley and a D.Eng from the University of Tokyo, where he has recently been named Fellow of the School of Engineering. He teaches undergraduate and graduate courses in radioactive waste management, covering broad aspects of radioactive waste management as well as safety assessment aspects of deep geologic repositories.

Robert J. Budnitz is on the scientific staff at the University of California's Lawrence Berkeley National Laboratory. His principal technical work has involved nuclear-reactor safety and security and the safety of radioactive-waste management. Dr. Budnitz previously held positions at the Lawrence Livermore National Laboratory (2002 to 2007); as President (1981 to 2002) of Future Resources Associates, Inc., a small consulting firm in Berkeley; as a senior officer on the staff of the U.S. Nuclear Regulatory Commission (Deputy Director and then Director of the Office of Nuclear Regulatory Research, 1978 to 1980); and at LBNL as a scientific researcher and later associate director for energy and environment programs (1967 to 1978). His work has emphasized risk-informed regulation, probabilistic methods for safety analysis, radioactive-waste management technology and safety, and a specialty in analyzing seismic effects at nuclear installations. Dr. Budnitz received his Ph.D. and M.A. degrees in experimental physics from Harvard, and a B.A. from Yale.

Cathryn Carson is Associate Professor of History at UC Berkeley, where she also directs the Office for History of Science and Technology. She studied physics, mathematics, and history and philosophy of science as an undergraduate (University of Chicago), earning an M.A. in physics before switching entirely to history of science for the Ph.D. (both Harvard). She works on and teaches the history of physics and nuclear history. Her current research deals with the history of the science behind nuclear waste management.

Alan Pasternak received AB in chemistry and BS in chemical engineering, Columbia University, 1955 and 1956, and Ph.D. in chemical engineering, University of California Berkeley, 1966. He did thesis research in nuclear engineering laboratories, "Liquid Metal Reprocessing of Uranium Reactor Fuel," under the supervision by Professor Donald Olander. 1956-1959 he served in US Navy as officer on destroyer type ships in Atlantic and Pacific Fleets. 1967-1975: he joined Lawrence Livermore National Laboratory. 1975-1979: Member, California Energy Commission, Sacramento. Since 1979, he worked as consultant on energy policy and low-level radioactive waste disposal policy. Since 1983, Technical Director, California Radioactive Materials Management Forum. 1990-2002: Member, Scientific Staff, Lawrence Livermore National Laboratory. Energy Program. (Part time.)