

## Freshman Seminar Course

### Title:

Not in my Backyard – What to do with Nuclear Waste? (current working title)

### Instructors

Gerald S. Frankel      Dept. of Materials Science and Engineering, College of Engineering

Andrew G. Keeler      School of Public Policy and Management, College of Social and Behavioral Sciences

### Goals:

This course will explore policy and technological issues associated with nuclear power and the safe disposal of high level radioactive waste generated by commercial nuclear power plants. Energy policy is central to the economic well being of our country, and the issues associated with nuclear power are vexing. The US Department of Energy is planning to build a permanent repository for high level radioactive waste inside Yucca Mountain, Nevada. This course will explore both the public policy and technology issues related to Yucca Mountain. Various aspects related to power production and nuclear plants will also be covered. The students will develop a fluency with these issues, thereby learning that the complex technological policy issues facing our country can be better understood, and that failure to make hard choices is not a policy solution to difficult issues.

### Quarter proposed for initial offering

Spring 2007

### Meeting times:

This will be a 1-credit course meeting once per week.

### Weekly topical outline:

1. Intro: history of nuclear waste generation and Yucca Mountain
2. Do we need nuclear power? The role of nuclear power in the context of the energy and environmental system
3. The problems with nuclear waste – an intelligent layman's guide to nuclear power generation, radioactive waste, radioactivity, and health dangers
4. Yucca Mountain – Long-term (10,000+ years) reliability and risk assessment
5. Options to Yucca Mountain:
  - reprocessing
  - on-site storage at power plants

- centralized storage solutions
- other types of geologic repositories, what is the rest of the world doing?
- sci-fi solutions (shoot it into outer space, deep ocean vents)

6. Nuclear waste and national/homeland security / proliferation issues

7. Issues and problems in siting a centralized storage solution (social, political, and economic problems)

8. Technical and cost issues in designing / evaluating disposal/storage solutions – materials, management systems, transportation issues, natural disasters, security

9. The Future of Nuclear Power – will it be safe? Does scale matter? What are the implications for the waste disposal problem?

10. Back to Yucca Mountain – should this facility be built, and under what technical standards, and with what compensation paid to residents?

10. Student Debate - The future of nuclear waste storage and nuclear power in general

### Assignments

Students will be responsible for reading 2-3 articles per week, and for being prepared to discuss this material (including specific questions given out with the readings). Students will occasionally be given specific responsibility for leading discussion on an article or topic.

### Assessment

Students will be graded on class participation and on several short written assignments.

### Reading List

*Will be developed if course is approved.*

Sample reading:

“The Nuclear Waste Primer,” The League of Women Voters Education Fund, 1993.

### Academic Misconduct Statement

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct ([http://studentaffairs.osu.edu/info\\_for\\_students/csc.asp](http://studentaffairs.osu.edu/info_for_students/csc.asp)).

### Disability Services Statements

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

### Bios

Gerald S. Frankel is Professor of Materials Science and Engineering at the Ohio State University and Director of the Fontana Corrosion Center. He earned the Sc.B. degree in Materials Science Engineering from Brown University in 1978 and the Sc.D. degree in Materials Science and Engineering from the Massachusetts Institute of Technology in 1985. He was a member of the DOE Peer Review Panel on Waste Package Materials Performance in 2002, and is part of a DOE-sponsored Corrosion Coop focusing on corrosion of waste package materials.

Andy Keeler is Associate Professor of Public Policy at the Ohio State University. He received his B.A. degree in economics from the University of North Carolina in 1979 and his Ph.D. in Natural Resource Economics from the University of California, Berkeley in 1991. Keeler served as the Senior Staff Economist for Environment at the President's Council of Economic Advisers (2000 – 2001) where he was a member of the US negotiating team for climate change and a diplomatic representative to OECD meetings on coordinating national sustainability policies. He served on the White House climate change policy teams under both President Clinton and President Bush. He has also worked as a senior economist at the Environmental Protection Agency's Innovative Strategies and Economics Group (1999-2000) and as an Economist for the Republic of Tanzania's Marketing Development Bureau (1982-1985).