

Freshman Seminar Course

Title:

Not in my Backyard – What to do with Nuclear Waste?

Instructors

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

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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.

Class size

The class will be limited to 10 students to allow for extensive class participation by everyone.

Weekly topical outline (reading material is listed prior to the relevant lecture):

1. Introduction: perceptions of nuclear power and nuclear waste

Reading Assignment

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

Chapter 1: Introduction

Office of Civilian Radioactive Waste Management website on the Yucca Mountain Project, About the Project web page (left column of topics):

<http://www.ocrwm.doe.gov/ymp/about/index.shtml>

Wikipedia Entry on Yucca Mountain:

http://en.wikipedia.org/wiki/Yucca_mountain

2. The Yucca Mountain Project

Reading Assignment

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

Chapter 2: Basic Information

Wikipedia Entry on nuclear power:

http://en.wikipedia.org/wiki/Nuclear_power

3. Nuclear power and radioactive waste overview

Reading Assignment

MIT, The Future of Nuclear Power (2003)

Chapter 1: The Future of Nuclear Power — Overview and Conclusions

Chapter 5: Nuclear Power Economics

4. Do we need nuclear power? Its role in the context of the energy and environmental system

Reading Assignment

Office of Civilian Radioactive Waste Management website on the Yucca Mountain Project, About the Project web page (right column of topics):

<http://www.ocrwm.doe.gov/ymp/about/index.shtml>

5. Long-term (10,000+ years) reliability and risk assessment

Reading Assignment

Yucca Mountain: The Most Studied Real Estate on the Planet, Report to the Chairman Senator James M. Inhofe, U.S. Senate Committee on Environment and Public Works Majority Staff :March 2006

Sierra Club website: <http://www.sierraclub.org/nuclearwaste/>

Citizen Alert website: <http://www.yuccamountainmatters.com/>

6. Alternatives to Yucca Mountain and the opposition viewpoint

Reading Assignment

Wikipedia Entry on the Non-Proliferation Treaty

MIT, The Future of Nuclear Power (2003)

Chapter 8: Nonproliferation

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

Reading Assignment

Barry Rabe, "The Ultimate NIMBY: Nuclear Waste Disposal", The Government Taketh Away, Leslie Pal and R. Kent Weaver eds. (Georgetown University Press, 2003):195-232

Daniel Mazmanian and David Morell. 1994. "The NIMBY Syndrome." In Norman Vig and Michael Kraft, eds. *Environmental Policy in the 1990s*. Washington DC: CQ Press, pp. 125 - 143.

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

Reading Assignment

MIT, *The Future of Nuclear Power* (2003)

Chapter 10 Recommended Measures to Resolve Uncertainty About the Economics of Nuclear Power

Chapter 11 Recommendations Bearing on Safety, Waste Management, and Proliferation

Chapter 12 Recommended Analysis, Research, Development and Demonstration Program

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?

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. Students will be required to prepare two written assignments, approximately 500 words in length, on topics assigned in class.

Assessment

Letter grading will be utilized in this course, 60% coming from class participation and 40% from the written assignments.

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).

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).