

NPRE 442. Radioactive Waste Management

**Syllabus for Spring 2023. Lecture: 3:30 to 4:50 pm, Tuesday and Thursday
in 3018 Campus Instructional Facility by Prof. W. R. Roy**

Date	Subject(s)	Class Assignments ¹
Jan. 17	Introduction	Student questionnaire
Jan. 19	Decay, Background Radiation, and Risk	1. Read Preface ²
Jan. 24	An Overview of Radioactive and Hazardous Waste	
Jan. 26	An Overview of Radioactive and Hazardous Waste	
Jan. 31	Radioactive Materials: Regulators, Health Impacts Radioactive Decay, Attenuation and Shielding	2. Read Chapter 1 Answer Review Questions 5, 6, 7, 8, and 13
Feb. 2	Dosimetry and Radiation Safety	
Feb. 7	Geochemical Fate and Transport of Radionuclides	3. Read Chapter 2 Answer Review Questions 2, 3, 4, and 6
Feb. 9	Uranium and Thorium Resources and Wastes Depleted Uranium	Class Demonstration: Uranium Ores 4. Read Chapter 3
Feb. 14	Low-Level Radioactive Waste Management	5. Read Chapter 4 Answer Review Questions 5, 8 and 9
Feb. 16	Managing Radioactive Graphite	
Feb. 21	Low-Level Waste Acceptance Criteria	
Feb. 23	Martinsville That Never Was	6. Read Chapters 5 and 6
Feb. 28	Used-Fuel Management	
March 2	Natural Geological Analogues, WIPP	7. Speciation and Solubility of Uranium, Cesium, and Strontium
March 7	Review for the Midterm	
March 9	Midterm	
March 21	Deep-Bore Disposal, Deep Isolation Deep-Well Injection of Radioactive Wastes	
March 23	Used-Nuclear Fuel Reprocessing	8. Read Chapter 9 Answer Review Question 6
March 28	Legacy Waste Management by U.S. DOE	
March 30	Hanford and the Savannah River Site Navy Spent Nuclear Fuel Management	9. The Uranium Diffusion Question
April 4	Treatment and Conditioning of Nuclear Wastes	
April 6	Long-Term Stability of Wasteforms	
April 11	Radiological Risk Assessment	
April 13	Transporting Radioactive Materials	10. Read Chapter 8 Answer Review Questions 1, 2, 3, 4, 5 and 11
April 18	International Radioactive Waste Management	
April 20	International Radioactive Waste Management	
April 25	International Radioactive Waste Management	11. Read Chapter 10 Answer Review Questions 2, 3, 4, 5, and 8
April 27	The Global Nuclear Energy Partnership	
May 2	Honors presentations, Review for the Final	
May TBA	Final Exam	

¹Dates are when assignments begin (due in one week).

²Reading assignments in the course textbook. Other Reading assignments will also include publications and on-line news articles from sources such as NEI SmartBrief, Nuclear Cafe, Nuclear Street, World Nuclear News, NNSS News, Midwestern Radioactive Materials Transportation Committee Newsletter, and U.S. DOE Office of Environmental Management.