

## NPRE 442. Radioactive Waste Management

Syllabus for Spring 2023. Lecture: 3:30 to 4:50 pm, Tuesday and Thursday  
in 2018 Campus Instructional Facility by Prof. W. R. Roy

Date	Subject(s)	Class Assignments <sup>1</sup>
Jan. 16	Introduction	Student questionnaire
Jan. 18	Social and Ethical Aspects: Part 1 Decay, Background Radiation, and Risk	Read Preface <sup>2</sup>
Jan. 23	An Overview of Radioactive and Hazardous Waste	
Jan. 25	An Overview of Radioactive and Hazardous Waste	
Jan. 30	Who Regulates Radioactive Materials? Potential Health Impacts of U, Ra, Pu, Cs, and <sup>3</sup> H Radioactive Decay, Attenuation and Shielding	A1. Read Chapter 1 Answer Review Questions 5, 6, 7, 8, and 13
Feb. 1	Dosimetry and Radiation Safety	
Feb. 6	Geochemical Fate and Transport of Radionuclides	A2. Read Chapter 2 Answer Review Questions 2, 3, 4, and 6
Feb. 8	Uranium and Thorium Resources and Wastes Depleted Uranium	Class Demonstration: Uranium Ores Read Chapter 3
Feb. 13	Low-Level Radioactive Waste Management	A3. Read Chapter 4 Answer Review Questions 5, 8 and 9
Feb. 15	Managing Radioactive Graphite	
Feb. 20	Low-Level Waste Acceptance Criteria	
Feb. 22	Martinsville That Never Was	Read Chapters 5 and 6
Feb. 27	Used-Fuel Management Social and Ethical Aspects: Part 2	
Feb. 29	Natural Geological Analogues Waste Isolation Pilot Plant	A4. Speciation and Solubility of Uranium, Cesium, and Strontium
March 5	Review for the Midterm	
March 7	<b>Midterm</b>	
March 19	Deep-Bore Disposal, Deep Isolation Deep-Well Injection of Radioactive Wastes	
March 21	Used-Nuclear Fuel Reprocessing	A5. Read Chapter 9 Answer Review Question 6
March 26	Legacy Waste Management by U.S. DOE	
March 28	Hanford and the Savannah River Site Navy Spent Nuclear Fuel Management	A6. The Uranium Diffusion Question
April 2	Treatment and Conditioning of Nuclear Wastes	
April 4	Long-Term Stability of Wasteforms	
April 9	Radiological Risk Assessment	
April 11	Transporting Radioactive Materials	A7. Read Chapter 8 Answer Review Questions 1, 2, 3, 4, 5, and 11
April 16	International Radioactive Waste Management	
April 18	International Radioactive Waste Management	
April 23	International Radioactive Waste Management	A8. Read Chapter 10 Answer Review Questions 2, 3, 4, 5, and 8
April 25	The Global Nuclear Energy Partnership Social and Ethical Aspects: Part 3	
April 30	Honors presentations, Review for the Final	
May 8	<b>Final Exam</b>	

<sup>1</sup>Dates are when assignments begin (due in one week).

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