

NRE 4404 Radiological Assessment and Waste Management (Elective)

Catalog Description: NRE 4404 Radiological Assessment and Waste Management (3-0-3)
 Prerequisite: NRE 3316
 Mathematical models for movement in the environment; scenario development for release, environmental transport, and exposure; radioactive waste disposal facilities and waste disposal technology.

Textbook: R. E. Faw and J. K. Shultis, Radiological Assessment: Sources and Exposures, 1st Edition, Prentice-Hall

Topics Covered:

1. Overview of Radiological Assessment
2. Synthesis of Scenario and Exposure Pathways
3. Modeling Atmospheric Dispersion of Radionuclides
4. Modeling Dispersion of Radionuclides in Surface and Ground waters
5. Pathway Analysis/Exposure Pathways (Terrestrial, Aquatic and Marine, Food chain)
6. Accident Scenarios
7. Human Health Risk Assessment
8. Radioactive Waste Forms
9. Regulation and Siting of Waste Management Facilities
10. Case Studies
11. Public Health, Environmental and Safety Aspects of Waste Management Practices
12. Low-Level Radioactive Waste Management
13. Transportation of Waste
14. Radioactive Waste Storage and Disposal
15. Remediation and Stabilization of Contaminated Sites
16. Decontamination and Decommissioning

Course Outcomes:

Outcome 1: To teach students to integrate the modeling tools to perform radiological assessments of waste disposal sites, nuclear facilities and contaminated sites.

- 1.1 Students will demonstrate an understanding of the determination of source terms, environment transport mechanisms, accumulation and dose computations.
- 1.2 Students will demonstrate that they understand the ability to integrate this knowledge to develop release scenarios and pathway models for dose assessment.
- 1.3 Students will demonstrate the ability to develop and perform radiological assessments for waste disposal sites, operating facilities and contaminated sites

Outcome 2: To train students to use such assessments to evaluate the efficacy of alternative design and restoration options using societal, economical and regulatory constraints.

- 2.1 Students will demonstrate the ability to suggest alternative design and restoration options incorporating an understanding of societal, economical and regulatory constraints.

Correlation between Course Outcomes and Program Educational Outcomes:

NRE 4404 Radiological Assessment and Waste Management	Outcome a			Outcome b	Outcome c	Outcome d	Outcome e	Outcome f	Outcome g	Outcome h	Outcome i	Outcome j	Outcome k
	i	ii	iii										
Course Outcomes													
Course Outcome 1.1							x						
Course Outcome 1.2							x						
Course Outcome 1.3							x						
Course Outcome 2.1								x		x		x	x

Prepared by: Nolan Hertel

Revised: October 2007