

NRE 4206 Radiation Physics Laboratory (Required)

Catalog Description: NRE 4206 Radiation Physics Laboratory (1-3-2)

Prerequisite: NRE 4208, NRE 3112

Measurements of reactor parameters such as approach to criticality, flux mapping, buckling, and diffusion length using subcritical assemblies.

Neutron spectral measurements, shield transmission measurements and other radiation field measurements.

Textbook: Class Notes

Topics Covered:

1. Approach to criticality
2. Flux mapping
3. Buckling measurements
4. Subcritical assembly measurements
5. Diffusion length measurement
6. Neutron spectral measurements
7. Foil activation methods
8. Shielding measurements
9. Dose measurements
10. Measurements in mixed radiation fields
11. Control rod worth measurements
12. Temperature coefficient measurements

Course Outcomes:

Outcome 1: To introduce the students to methods of measuring reactor parameters.

- 1.1 Students will integrate their previous measurement experience and reactor physics knowledge to measure reactor physics parameters.
- 1.2. Students will demonstrate their ability to analyze experimental data.

Outcome 2: To train the students in the fundamentals of neutron measurements and neutron parameters for reactor, shielding and other applications.

- 2.1 Students will demonstrate an understanding of neutron detection techniques.
- 2.2 Students will demonstrate an ability to analyze experimental neutron data for spectral reconstruction.

Outcome 3: To introduce the students to design of experiments to measure radiation and/or reactor parameters.

- 3.1 Students will demonstrate that they can plan and carry out a measurement of radiation or reactor parameters
- 3.2 Students will be able to perform a literature search to assist in the development of an experimental plan

Outcome 4: To develop students written communication skills

4.1 Students will demonstrate the ability to write laboratory reports, technical memorandums, and an experimental plans.

Correlation between Course Outcomes and Program Educational Outcomes:

NRE 4206 Radiation Physics Laboratory	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 Outcome 1.1		x	x	x									
Course Outcome 1.2		x					x						
Course Outcome 2.1		x	x										
Course Outcome 2.2		x					x						
Course Outcome 3.1				x									
Course Outcome 3.2											x		
Course Outcome 4.1									x				

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