NRE 4234 Nuclear Criticality Safety Engineering (Elective)

Catalog Description: NRE 4234 Nuclear Criticality Safety Engineering (2-3-3)
Prerequisite: NRE 4204
This course covers the theoretical concepts, the computational techniques and the principal methods of criticality safety.

Textbook: *Nuclear Criticality Safety - Theory and Practices,* R. A. Knief, ANS, 1986

Topics Covered:

1. Fundamentals: Principles of Safety and Review of Reactor Theory
2. Criticality Accidents
3. Experiments: Methods, Accident Simulations, Critical data
4. Computational Methods: S-N, Monte Carlo, Cross Sections, Validations
5. Subcritical Limits
6. Double Contingency
7. Hand Calculations: Buckling/Shape Conversion, Surface Density, Solid Angle Method
8. Standards, Regulations, Related Impacts and Practices
9. Fuel Facility Applications

Course Outcomes:

Outcome 1:   To teach the principals of nuclear criticality safety including the computational methods used in this discipline.

1.1: Students will demonstrate the ability to write criticality safety evaluations, validate computational tools, evaluate critical experiments and analyze accident excursions and design fuel storage configurations.

Correlation between Course Outcomes and Program Educational Outcomes

NRE 4234 Nuclear Criticality Safety Engineering	Outcome a			Outcome b	Outcome c	Outcome d	Outcome e	Outcome f	Outcome g	Outcome h	Outcome i	Outcome j	Outcome k
Course Outcomes	i	ii	iii										
Course Outcome 1.1		x					x		x				

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