NRE 3316 Radiation Protection Engineering (Required)

Catalog Description: NRE 3316 Radiation Protection Engineering (3-0-3)
Prerequisite: NRE 3301, MATH 2403
Covers radiation dosimetry, biological effects of radiation, radiation-protection criteria and exposure limits, external radiation protection, internal radiation protection, and sources of human exposure.

Textbook: Turner, Atoms, Radiation and Radiation Protection, Wiley-Interscience, 2nd Edition, 1995. (used through Spring 2007)
Martin and Lee, Principles of Radiological Health and Safety, Wiley-Interscience, 2003 (starting Spring 2008).

Topics Covered:

1. Particle Interactions of Importance to Radiation Protection
2. Review of Serial Radioactive Decay
3. Radiation Fields and Sources
4. Dose Quantities
5. Computation and Measurement of Dose
6. Radiation Protection Criteria, Exposure Limits, Risk, and Regulation
7. Biological Effects of Radiation
8. Radiation Shielding
9. Point Kernel Methods and Buildup Factors for Gamma-Rays Shielding
10. Introduction to Monte Carlo Simulation
11. External Radiation Protection
12. Internal Radiation Protection
13. Natural and Man-Made Sources of Radiation Exposure

Course Outcomes:

Outcome 1: To provide a fundamental understanding of the biological effects of radiation, internal and external dosimetry, radiation protection and radiation shielding.

1.1 Students will demonstrate that they understand fundamentals of the biological effect of radiation, internal and external dosimetry through executing homework assignments and examinations.

1.2 Students will demonstrate that they can apply the appropriate principles referred to in objective 1 to the solution of practical radiation protection problems by the execution of a project and the design of examinations.

Correlation between Course Outcomes and Program Educational Outcomes:

NRE 3316 Radiation Protection 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
Course Outcome 1.2				x		x							x

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