

Applied Nuclear Engineering

Spring 2024

EEL 4930 U08 Sp Top Elec Eng

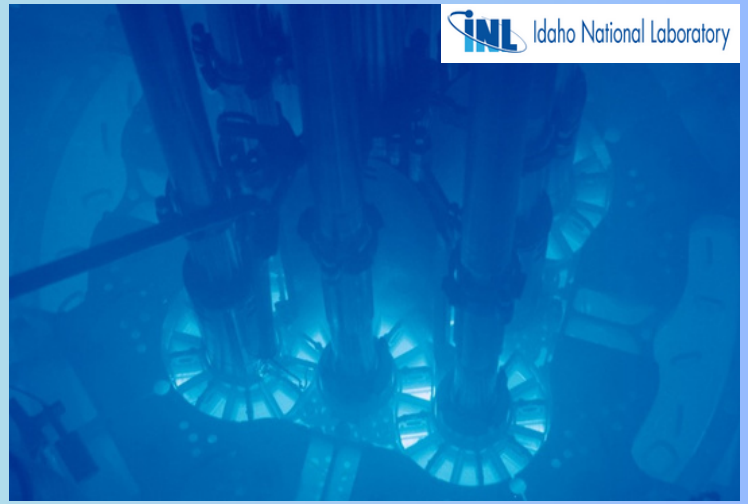
EEL 5935 U08 Adv Spec Topics

Class Date: January 08--April 20

Time: Tuesday & Thursday

11:00 am--12:15 pm

Room: EC 2420



We will begin by retracing the steps of famous radiation experiments and hypotheses. Next we will set the stage and context for our study of radiation, by showing details of the systems and reactors which use radiation. The rest of the course will be dedicated to describing the origins, interactions, uses, detection, and biological/chemical effects of ionizing radiation.

Course Topics

- Nuclear Mass and Stability, Nuclear Reaction and Notation, Introduction to Cross Section
- Q-Equation Continued and Examples
- Radioactive Decay Continued
- Nuclear Reactor Construction and Operation
- Ion-Nuclear Interactions
- How Nuclear Energy Works
- Simplifying Neutron Transport to Neutron Diffusion
- Transients, Feedback, and Time-Dependent Neutronics
- Nuclear Materials-Radiation Damage and Effects in Matter
- Radiation Dose, Dosimetry, and Background Radiation
- Radiation Hormesis

Course Overview

Radiation is the central aspect which makes nuclear science and engineering (NSE) its own discipline, and sets the foundation for almost all of modern physics.

Course Objectives

- Dive deep into the origins, interactions, and effects of ionizing radiation.
- Learn the practicalities of nuclear reactor construction and operation
- With a focus on radiation dose, dosimetry, and background radiation, students will be well-equipped to understand the implications and relevance of radiation in everyday life.
- From understanding how nuclear energy works to the intricate details of ion-nuclear interactions, students will receive a holistic education, covering both theoretical concepts and practical applications.

**Speakers will be invited from
Idaho National Laboratory (INL)**

For more information, contact Prof. Deidra R. Hodges, dhodges@fiu.edu