

EHS 219
RADIATION PROTECTION

COURSE DESCRIPTION:

Prerequisites: None

Corequisites: None

This course covers theory, detection, health effects, and regulation of ionizing radiation. Particular emphasis is on compliance with federal regulations in the occupational setting. Upon completion, students should be able to aid in implementation of a radiation protection programs in an industrial or institutional setting. Course Hours Per Week: Class, 3. Semester Hours Credit, 3.

LEARNING OUTCOMES:

Upon completion of this course, the student will be able to:

- a. Differentiate between ionizing and non-ionizing radiation.
- b. Describe the different types of ionizing radiation.
- c. Describe the health effects of differing dose ranges of ionizing radiation.
- d. Perform basic dosage calculations for exposures to ionizing radiation.
- e. Demonstrate familiarity with different methods of evaluating radiation hazards.
- f. Implement basic control measures for limiting exposure to ionizing radiation.
- g. Locate appropriate NRC and OSHA exposure limits.
- h. Demonstrate familiarity with regulations for the transport and disposal of low-level radioactive waste.

OUTLINE OF INSTRUCTION:

- I. Radiation Physics
 - A. Atomic structure
 - B. Electromagnetic radiation
 - C. Particulate radiation
 - D. Ionizing vs. non-ionizing radiation
 - E. Sources of ionizing radiation
 - F. Interaction of radiation with matter

- II. Radiation Dosage
 - A. Measures of activity
 - B. Measures of absorbed dose
 - C. Internal vs. external exposures
 - D. Health effects: acute
 - E. Health effects: chronic
 - F. Health effects: genetic

- III. Assessment of Radiation Hazards
 - A. Geiger-Muller counter
 - B. Scintillation detectors
 - C. Measurement of dose rates
 - D. Personal dosimetry
 - E. Monitoring for contamination

- IV. Radiation in the workplace
 - A. Radiation safety programs
 - B. Training
 - C. Personnel monitoring
 - D. Personal protective equipment
 - E. Procedural controls

- V. Shipping, Storage and Disposal
 - A. Transportation
 - B. Storage
 - C. Disposal
 - D. Regulatory considerations

REQUIRED TEXTBOOKS AND MATERIALS:

To be determined by instructor.

STATEMENT FOR STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 686-3652 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.