

**University of Arkansas – Fort Smith**  
**5210 Grand Avenue**  
**P. O. Box 3649**  
**Fort Smith, AR 72913–3649**  
**479–788–7000**

**General Syllabus**

**RISP 12302 Radiation Physics**

Credit Hours: 2

Lecture Hours: 2

Laboratory Hours:

Prerequisites: MATH 11003 College Algebra and CHEM 10003 Chemical Principles

Prerequisite or corequisite: BIOL 24103/24101 Human Physiology/Laboratory

Corequisites: RISP 11004 Introduction to Radiography, RISP 11102 Radiographic Procedures I, and RISP 11204 Clinical Education I

Effective Catalog: 2019-2020

**I. Course Information**

**A. Catalog Description**

Basic concepts in radiation physics will be presented. Fundamentals of x-ray generating equipment as well as x-ray production, beam characteristics, and units of measurement are explored.

**B. Additional Information – None**

**II. Student Learning Outcomes**

**A. Subject Matter**

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

1. State the fundamental units of the English, metric, and SI systems and solve problems converting units from one system to the other.
2. Define and describe the general principles that relate to inertia, work, energy and momentum.
3. Define mixture, substance, element, compound, molecule, and atom.
4. Define Bohr's theory of atomic structure.
5. Define terms relating to atomic nomenclature.
6. Discuss covalent and ionic bonding
7. Explain the process of ionization.
8. Describe the electromagnetic spectrum.
9. Define and describe wavelength and frequency and how they are related to velocity.
10. Explain methods of electrification.
11. Explain the laws of electrostatics and their application.

12. Identify Ohm's law and solve parallel and series circuit problems.
13. Define magnetism discuss the laws of magnetism.
14. Discuss electromagnetic induction.
15. Describe types and functions of generators, motors, transformers, and rectification systems.

**B. University Learning Outcomes**

This course enhances student abilities in the following areas:

**Analytical Skills**

**Critical Thinking Skills:** Students will use analytical/critical thinking skills to draw conclusions and/or solve problems associated with radiation physics.

**Quantitative Reasoning:** Students will apply appropriate mathematical formulas in order to solve problems associated with radiation physics.

**III. Major Course Topics**

- A. Units of Measure
- B. General Physic Principles
- C. Structure of Matter
- D. Structure of the Atom
- E. Nature of Radiation
- F. Electrostatics
- G. Electrodynamics
- H. Magnetism
- I. Electromagnetism
- J. X-Ray Circuits