

## **Course Description**

### **RAT 1614C | Radiation Therapy Physics I | 2 credits**

This course is an introduction to basic radiation physics, containing fundamental principles and concepts. The course includes radiation production, properties, and characteristics as well as structure of the atom and matter, electrostatics, magnetism, electrodynamics, and the electromagnetic spectrum.

## **Course Competencies**

### **Competency 1:**

The student will demonstrate proficient knowledge of physics pertinent to the understanding of radiations used in the clinical setting by:

1. Define the fundamental units of the English, metric and Système International d'Unités (SI) systems.
2. Calculate various unit conversions.
3. Demonstrate applications of the general principles that relate to inertia, work, energy and momentum.
4. Compare covalent bonding and ionic bonding.
5. Describe the nature of light.
6. Compare various photon interactions in terms of description of interaction, relation to atomic number and applications.
7. Discuss relationships of wavelength and frequency to beam characteristics.

#### Learning Outcomes

- \*Learning outcome 3\*

### **Competency 2:**

The student will demonstrate knowledge of the structure of the atom and matter by:

1. Describe Bohr's theory of atomic structure.
2. Compare the characteristics and functions of a proton, neutron, and electron.
3. Discuss the energy levels of the atom.
4. Define the terms relating to atomic nomenclature.

#### Learning Outcomes

- \*Learning outcome 3\*

### **Competency 3:**

The student will demonstrate knowledge of magnetism and electrodynamics by:  
by:

1. Describe the properties and laws of magnetism.
2. Explain the laws of electrostatics and their application.
3. Explain the electronic spin of an element to its potential magnetic properties.

4. Discuss the interaction between electric and magnetic fields.

Learning Outcomes

- \*Learning outcome 3\*

**Competency 4:**

The student will demonstrate knowledge of radiation production by:

1. State the principles of x-ray production.
2. Differentiate between the radiations of the electromagnetic (EM) spectrum.
3. Describe the process of ionization.

Learning Outcomes

- \*Learning outcome 3\*