Miami Dade College

Course Description

RTE1613 | Radiation Physics | 2.00 credits

Radiation physics is an integral part of radiographic imaging. A substantial portion of the American Registry of Radiologic Technologists (ARRT) certification examination is comprised of equipment operation and maintenance principles as well as the foundations of image production. This course will cover many of the basic principles of physics involving x-ray interactions with matter, foundations of image production, and concepts of safe equipment operation

Course Competencies

Competency 1: The student will be able to describe the basic composition of matter and the characteristics of different classifications of radiation by:

1. Describing fundamental atomic structure
2. Describing the electromagnetic spectrum
3. Explaining the relationship of energy, wavelength and frequency
4. Explaining the wave-particle duality phenomena
5. Identifying the properties of x-rays
6. Comparing the production of bremsstrahlung and characteristic radiations
7. Explaining the factors that affect the x-ray emission spectrum

Competency 2: The student will be able to explain concepts of electrostatics, electrodynamics, and electromagnetism by:

1. Identifying the different types of magnetic objects.
2. Reciting the laws of electromagnetism
3. Solving problems using the left thumb rule
4. Solving problems using the left-hand thumb rule
5. Solving problems using Ohm's law
6. Defining the terms voltage, ampere, resistance

Competency 3: The student will be able to identify and describe the components of x-ray imaging system, production and safe handling of x-rays by:

1. Describing potential difference, current and resistance
2. Describing the general components and functions of the tube and filament circuits
3. Comparing generators in terms of radiation produced and efficiency
4. Describing the components and function of automatic exposure control (AEC) devices
5. Explaining methods used to extend x-ray tube life
6. Tracing an electrical impulse throughout a circuit schematic
7. Identifying the steps in thermionic emission

Learning Outcomes:

- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information