



Course Description

RTE2385 | Radiation Biology | 2.00 credits

This course is designed to provide the students with the necessary knowledge of the biologic effects of the interaction of ionizing radiation with living matter. The course will also prepare the students to become a global citizen by recognizing the impact of humans on the environment and taking the necessary steps to change their lifestyles to protect the environment.

Course Competencies

Competency 1: The student will be able to demonstrate comprehension of the need for radiation protection for both the patient and technologist by:

1. Describing the ALARA concept
2. Identifying ionizing radiation sources from natural and man-made sources
3. Defining radiation and radioactivity units of measurement
4. Identifying the basis for occupational exposure limits
5. Identifying appropriate applications and limitations for each radiation detection device
6. Describing personnel monitoring devices, including applications, advantages and limitations for each device

Competency 2: The student will be able to discuss and apply the radiation dose reduction methods necessary for personnel and members of the general population by:

1. Complying with legal and ethical radiation protection responsibilities of radiation workers
2. Identifying performance standards for beam-limiting devices
3. Explaining the relationship of beam-limiting devices to patient radiation protection
4. Distinguishing between primary and secondary radiation barriers
5. Discussing added and inherent filtration in terms of the effect on patient dosage
6. Discussing how time, distance and shielding can be manipulated to keep radiation exposures to a minimum

Competency 3: The student will be able to discuss the fundamental aspects of radiobiology and short-term and long-term effects of radiation by:

1. Describing principles of cellular biology
2. Discriminating between the direct and indirect effects of radiation
3. Describing physical, chemical and biologic factors influencing radiation response of cells and tissues
4. Differentiating between somatic and genetic radiation effects and discuss specific diseases or syndromes associated with them
5. Discussing stochastic and deterministic effects
6. Discussing embryonic and fetal effects of radiation exposure
7. Relating short-term and long-term effects as a consequence of high and low radiation doses

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
- Demonstrate knowledge of diverse cultures, including global and historical perspectives