MOHAWK VALLEY COMMUNITY COLLEGE, UTICA-ROME, NY

Radiological Technology

COURSE OUTLINE

1. COURSE DESCRIPTION:

**RT101 Fundamentals of Radiology** C-2, P-0, Cr-2

This course provides an introduction to the basic concepts of radiographic physics and exposure. Topics include detailed history of x-ray, radiographic tube construction, process of x-ray production, x-ray beam characteristics, and the photographic and geometric properties of the radiographic image. The foundations of radiography and the practitioners’ role in the health care delivery system are discussed.

**Prerequisites:** MA089

**Corequisites:** RT100, RT102, RT103, BI216

1. STUDENT LEARNING OUTCOMES

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

1. Describe atomic structure and the ways ionization of atoms can occur.
2. Discuss the history of the discovery of x-ray.
3. Describe the function of the radiographic tube structures.
4. Describe the production of x-rays process and the target interactions involved.
5. Explain the purpose of a radiation control program as based on ALARA.
6. Distinguish among the various general manifestations of radiation and list the properties of x-ray.
7. Explain the radiation dose specification of equivalent does and the potential for biologic harm due to radiation exposure.
8. Compare the sources of ionizing radiation, describing the various interactions x-ray may have with matter.
9. Identify the various methods of controlling radiation dose to patients and occupationally based on the “no threshold concept”.
10. Describe the portions of the x-ray beam: primary, secondary, remnant, and absorbed radiation, and the 3 processes of beam attenuation.
11. Distinguish between x-ray quality and quantity as pertaining to kVp &mAs.
12. Demonstrate an understanding of receptor exposure, image brightness and image grayscale.
13. Distinguish between spatial resolution, recorded detail, and distortion.
14. Identify the health science professions, also including those specific to medical imaging, that cooperate as members of the patient’s health care team.
15. Explain the purposes of accreditation, credentialing, certification, registration, licensure and regulations and the importance of continuing education.
16. MAJOR TOPICS:
17. Introduction to Radiographic Physics
    1. Ionization of an Atom
    2. Discovery of X-rays
    3. Radiographic Tube
    4. Target Interaction
    5. The X-ray Beam
    6. X-ray Exposure
18. Introduction to Radiation Protection
    1. Atomic Structure
    2. Introduction to Radiation Protection
    3. Radiation
    4. Sources of Ionizing Radiation
    5. Interaction of X-radiation with Matter
    6. Measurement Units of Ionizing Radiation
    7. General Information: NCRP Dose Limits
    8. Patient and Occupational Radiation Control
19. Introduction to Radiographic Exposure
    1. Image Formation
    2. Radiographic Quality
    3. Digital Imaging
    4. Primary Exposure Factors
    5. Secondary Exposure Factors
    6. Patient Factors
    7. Special Considerations
20. Radiologic Science and Health Care