

Department of Clinical Laboratory & Medical Imaging Sciences
Radiologist Assistant Program, BSMIS RIM & RIM Certificate
MSRA 5100 Radiobiology, Radiation Safety & Health Physics

Course Description

This course covers the principles of radiation biology and protection. The fundamentals of medical imaging physics are presented and correlated with information on the operation of medical imaging modalities. The protection of individual and population groups against the harmful effects of ionizing and non-ionizing radiation is the central theme throughout the course. This includes an overview of the regulatory bodies and patient radiation safety regulations applicable to the medical imaging environment. Interaction of ionizing radiation with matter, units of exposure and dose, and radiation detection devices are discussed. Practical techniques and QA/QC procedures for reducing the risk of patient and operator exposure to radiation are presented.

Content also includes the operation of the fluoroscopic devices used in diagnostic/therapeutic patient exams. Procedures and techniques to optimize image quality while reducing radiation exposure to patients, operator and ancillary personnel are also included. Regulatory issues and QA requirements specified by agencies such as the NRC, NJDEP, NCRP, and EPA are covered.

Credits/Modes of Instruction

3.0 Web Based

Prerequisites

General Requirements

The expectation is that students are graduates of an accredited entry level Radiologic Technologist program, and have received training in radiation protection and basic radiographic physics at the associate degree level. Course content is delivered primarily via the Internet; therefore, students are expected to be self-directed learners capable of functioning effectively in a distance learning environment.

Technical Requirements

Students should possess basic computer skills such as: Internet browsing and searching, e-mailing, word processing, and file transfer (uploading/downloading). Participants must also have remote (off-campus) access to Internet services: including at least Internet browsing capability and e-mail. The following programs are used extensively in the delivery of course content: Microsoft Word, PowerPoint, and Adobe Acrobat.

Course Goals and Objectives:

Goals

The aim of the course is to prepare students who are:

- A. knowledgeable of the fundamental principles, terminology, and theories that are relevant to Radiobiology, Radiation Safety, and Health Physics.
- B. able to gather, assimilate, and apply the most current information on issues concerning medical imaging instrumentation, quality assurance, and safety in the Radiology environment.

- C. able to evaluate Radiology quality assurance programs utilizing established professional standards, and state and federal regulations.
- D. knowledgeable of the design features, and principles of operation of fluoroscopic equipment.

Objectives

1. The student shall be able to define the fundamental principles of radiation protection, health physics and equipment safety measures.
2. The student will be able to develop and evaluate the key components of a Quality Assurance Manual.
3. The student shall be able to define the difference between stochastic and deterministic effects of radiation and its symptoms.
4. The student shall be able to explain the practical techniques that can be used to protect the patient from ionizing radiation and the dose limits for the clinical personal, fetus and the general population.

