

NVCC COLLEGE-WIDE COURSE CONTENT SUMMARY

RAD 205 - RADIATION PROTECTION AND RADIOBIOLOGY (3 CR.)

COURSE DESCRIPTION

Studies methods and devices used for protection from ionizing radiation. Teaches theories of biological effects, cell and organism sensitivity, and the somatic effects of ionizing radiation. Presents current radiation protection philosophy for protecting the patient and technologist. Lecture 3 hours per week.

GENERAL COURSE PURPOSE

The purpose of the course is to inform students of the hazards of working with radiation in a medical environment and the different techniques available for minimizing radiation exposure. This course is divided into two basic categories. The first half of the semester will be devoted to radiation protection of patient and personnel, which will be applicable during their clinical training. The second half of the semester the student will understand the effects of ionizing radiation in the biologic systems.

ENTRY LEVEL COMPETENCIES

Completion of all previous RAD courses with a grade of "C"

COURSE OBJECTIVES

At the conclusion of this course of study, the student will be able to:

- A. describe the concept of radiation hazards,
- B. use professional terminology appropriately,
- C. identify quantities and units related to radiation protection,
- D. describe means for radiation protection of staff,
- E. describe means for radiation protection to patients,
- F. specify safety concerns related to the use of x-ray equipment,
- G. describe the effects of radiation on the human body,
- H. identify genetic effects related to the study of radiation,
- I. understand the term radiation oncology,
- J. describe the radiation syndromes.

MAJOR TOPICS TO BE INCLUDED

- A. Radiation Protection
 1. Need for radiation protection
 2. Basic interactions with matter
 3. Quantities and Units
 4. Patient Protection
 5. Personnel Protection
 6. Maximum permissible dose
 7. Personnel exposure monitoring
- B. Radiobiology
 1. Effect of irradiation
 2. Direct and indirect interactions
 3. Molecular and Cell Biology
 4. Modifying effects of radiation
 5. Short term effects

6. Genetics
7. Radiation effects of reproduction
8. Radiation effects of immunity
9. Immunology

EXTRA TOPICS TO BE INCLUDED

Experiments demonstrating the effects of irradiation.