

RADT 206

Radiation Protection/Radiobiology

2 Credits

Community College of Baltimore County Common Course Outline

Description

RADT 206 – Radiation Protection/Radiobiology: a course in which students discuss ionizing radiation and the need for protective measures and maximum safety in diagnostic radiology. The types of radiation and their origins are discussed along with a review of the interactions of radiation with matter. The effect of technical factors on exposure dose is investigated along with ways to reduce both patient and radiographer exposure. Radiation effects on biological molecules and organisms, and factors affecting biological response are presented. 2 credit hours: 2 lecture hours per week; 15 weeks. Offered fall semester.

Pre-requisites: RADT 204, RADT 205

Co-requisites: RADT 207, RADT 208

Overall Course Objectives

Upon completion of this course, students will be able to:

1. describe the historical perspective of radiation protection;
2. explain the various types of ionizing radiation and their sources;
3. differentiate between the various x-ray interactions with matter;
4. identify the structure and function of cellular components;
5. compare and contrast the units of measuring dose and exposure, both traditional and system international;
6. describe the methods and devices employed to provide protection from ionizing radiation for both a patient and radiographer;
7. list various laws, regulations, and agencies that recommend policy and regulate devices that employ ionizing radiation;
8. explain the concept of risk vs benefit;
9. summarize dose-response relationships;
10. state the concept of ALARA;
11. categorize early and late effects of radiation; and
12. generate results from a personal interview of a non-imaging healthcare professional on the topic of radiation protection.

Major Topics

- I. Goal of Radiation Protection
- II. Radiographer's Responsibilities
- III. Major Natural and Artificial Sources of Radiation

The Common Course Outline (CCO) determines the essential nature of each course.

For more information, see your professor's syllabus.

- IV. Particulate and Electromagnetic Radiation
- V. Interactions of Radiation with Matter
- VI. Units of Radiation
- VII. Dose Equivalent Limits
- VIII. Methods of Reducing Radiation Exposures
- IX. Personnel Monitoring Devices
- X. Equipment Designs
- XI. Direct and Indirect Effects of Radiation
- XII. Cellular Radiosensitivity
- XIII. Whole-body Radiation Effects
- XIV. Fetal Radiation Effects
- XV. Radiation Mutagenesis and Radiation Carcinogenesis

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- 8 Homework Assignments
- 1 Group Project
- 6 Quizzes
- 1 Test
- 1 Cumulative Final Exam

Written assignments and research projects: Students are required to use appropriate academic resources in their research and cite sources according to the style selected by their professor.

Other Course Information

The American Registry of Radiologic Technologists (ARRT) has established a minimum scaled passing score of 75%. The Radiography program has developed standards of grading that are consistent with grading systems of other programs. Letter grades will be distributed according to the following standards:

92 -100 A

83 -91 B

75 -82 C

65 -74 D

Below 65 F

This course is a required course in the AAS Radiography program within the Medical Imaging Department. All RADT courses must be passed with a grade of C or better.

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