CUMBERLAND COUNTY COLLEGE

Course: RT 121 Radiation Protection and Biology

Credits: 3

Prerequisites
RT101, RT102, RT103, RT104, BI 106

Co-requisites
RT106, RT107, RT110, BI 107

Course Description
This course provides an overview of the principles of the interaction of Radiation with living systems. Factors affecting biological response are discussed as well as the responsibilities of the radiographer for patient, personnel and public safety. Radiation Health and safety requirements are incorporated. Upon completion of the course, the student will understand the concept of and demonstrate the ALARA principle in clinical activity.

Learning Outcomes
At the completion of the course, students will be able to:

- Recognize the basic interactions of x-radiation with matter, the units of radiation and the effective dose equivalents for staff and the public
- Become familiar with the effects of radiation on the single cell, the various body systems and the developing embryo.
- Practice radiation safety measures for protection of both patient and practitioners within the clinical setting.
- Interpret radiobiology information presented in graph form as published in textbooks and periodicals.
- Access the internet to research professional organization offerings and information regarding the radiologic sciences.
- Discuss the relationship between quality assurance, quality control and radiation protection practices.
- Form a personal opinion with regard to the biological effects associated with radiation used for diagnostic imaging.

Topical Outline

- History of Radiology
- Intro to Radiation Protection
- Interactions of X-ray with Matter
- Radiation Quantities and Units
- Dose limits
- Radiation Monitoring
- Cell Biology
- Radiation Biology

- Equipment Design
- Management of Patient Radiation Dose
- Management of Imaging Personnel Radiation Dose

Required Texts and Other Materials

Statkiewicz-Sherer, Mary Alice, Russel, E. and Visconti, Paula J., *Radiation Protection in Medical Radiography, 7th edition,* Elsevier, 2014.

Reference texts

Bushong, Stewart C., *Radiologic Science for Technologists- Physics, Biology and Protection*,10th *edition*, Elsevier 2013

Carlton and Adler, *Principles of Radiographic Imaging an Art and a Science, 5th edition*, Delmar Cengage learning, 2013.

Selman, Joseph, *The Fundamentals of Imaging Physics and Radiobiology, 9th edition*, Charles C. Thomas, Publisher, 2000.

Student Assessment

Assessment may be accomplished through projects, portfolios, exams, presentations and/or papers

The grade for this course will be determined as follows:

- Tests = 75%
- Final Exam = 25%

Class absences will be deducted from the course grade as follows:

- 0.50 for each absence and
- 0.25 for each lateness or early departure.

Academic Integrity

Plagiarism is cheating. Plagiarism is presenting in written work, in public speaking, and in oral reports the ideas or exact words of someone else without proper documentation. Whether the act of plagiarism is deliberate or accidental [ignorance of the proper rules for handling material is no excuse], plagiarism is, indeed, a "criminal" offense. As such, a plagiarized paper or report automatically receives a grade of **ZERO** and the student may receive a grade of **F** for the semester at the discretion of the instructor.

Available Resources

If you are having difficulty with work in this class, tutoring is available through the Success Center. If you think that you might have a learning disability, contact Project Assist at 856.691.8600, x1282 for information on assistance that can be provided to eligible students.

(List availability of open labs and/or writing center)

Before Withdrawing From This Course

If a student experiences adverse circumstances while enrolled in this course and considers withdrawing, s/he should see an advisor (division or advisement center) BEFORE withdrawing from the class. A withdrawal may cause harmful repercussions to completion rate standards and

overall GPA which can limit or eliminate future financial aid in addition to causing academic suspension.