

# Common Course Outline

## RTTT 127

### Radiation Therapy Physics II

3 Credits

## The Community College of Baltimore County

### Description

**RTTT 127 – 3 credits – Radiation Therapy Physics II** provides an analysis of the structure of matter, properties of radiation, nuclear transformations, x-ray production, and interactions of ionizing radiations. Measurement and quality of ionizing radiation, absorbed dose measurement, dose distribution and scatter analysis are introduced.

### **3 credits**

**Pre-requisites: RTTT 125; Admission to the Radiation Therapy Program; this course is only offered in the spring semester**

**Co-requisites: RTTT 107 and RTTT 113**

### Overall Course Objectives

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

1. describe and identify isotope, isobar, and isomer;
2. explain nuclear stability and types of radioactive decay;
3. describe electromagnetic (EM) radiation and the characteristics of the EM spectrum;
4. describe the processes of ionization and excitations;
5. define and compare radioactivity, decay constant, activity and half-life;
6. describe x-ray production for linear accelerators;
7. explain the factors that influence x-ray production and output;
8. explain linear energy transfer (LET);
9. compare photon interactions with matter and classify radiations produced by direct and indirect ionization;
10. explain major influencing factors of photon beam attenuation;
11. calculate half-value layer (HVL);
12. choose the appropriate type of radiation detector for given clinical applications;
13. explain correction factors for chamber calibration, temperature, pressure, etc.;
14. compare absorbed dose vs. exposure; and
15. compare source-skin-distance (SSD) and isocentric (SAD) methods of calibration.

### Major Topics

- I. Properties of Radiation
- II. Nuclear Transformation
- III. Production of X-Rays

- IV. Radiation Therapy Treatment Units
- V. Interaction of Ionizing Radiation
- VI. Measurement of Ionizing Radiation
- VII. Quality of X-Ray Beams
- VIII. Dose Distribution

### **Course Requirements**

Grading/exams: Grading procedures will be determined by the individual faculty member but will include the following:

Students will take a midterm and a final exam  
Students must pass their final exam with a 75% or higher  
Students will complete weekly quizzes and assignments

### **Other Course Information**

This course is a Radiation Therapy core course.  
This course is part of a program sequence and offered in the spring only.

Date Revised: 02/25/12