

Virginia Western Community College

ROC 141

Therapy Physics I

Prerequisites

Successful completion of ROC 110, ROC 163.

Course Description

Focuses on concepts of radiation production, interaction, and influencing factors. Emphasis is placed on atomic interactions and dose measurement techniques. Presents a comprehensive overview of the different types of machines used in Radiation Oncology. Evaluation of student will be through weekly homework assignments and examinations.

Semester Credits: 2

Lecture Hours: 2

Lab/Clinical/Internship Hours: 0

Required Materials

Textbook:

The Physics and Technology of Radiation Therapy. McDermott, P. and Orton, C. (2010). Medical Physics Publishing. ISBN: 978193052432-

Other Required Materials:

A TI-30XS or equivalent calculator is required for the course. Equivalent means the keypad has the same layout as the Pearson-Vue® on screen calculator.

Course Outcomes

At the completion of this course, the student should be able to:

- Describe the characteristics of various elements using a periodic table
- Examine the properties of photons and apply those properties as they relate to Radiation Oncology
- Compare various types of radioactive decay, and perform decay calculation
- Describe how x-rays are produced at the atomic level and how the components of an x-ray tube work
- Describe the various interactions of high-energy x- and gamma rays with matter
- Compare physical characteristics and basic operation of a variety of treatment units

Topical Description

1	Mathematics Review
2	Mathematics Review
3	Review of Basic Physics
4	Atomic Nuclei and Radioactivity
5	X-ray Production I: Technology
6	X-ray Production II: Basic Principles
7	Interaction of Radiation with Matter
8	Radiation Measurement Quantities
9	Radiation Detection and Measurement
10	External Beam Radiation Therapy Units
11	Imaging in Radiation Therapy
12	Radiation Protection
13	Physical Quality Assurance and Patient Safety
14	Review for Final

Note to Instructors

1. This is a rough outline of the course content. At the discretion of the instructor, some content may be omitted based on the progress of the class as a whole.