

Virginia Western Community College

ROC 242

Clinical Radiobiology

Prerequisites

None

Course Description

This course is an advanced study into the principles of biologic responses to radiation. Focus will be on the events that occur following absorption of energy from radiation at the cellular, tissue, systemic whole body levels, and factors that influence the effects.

Semester Credits: 2

Lecture Hours: 1

Lab/Clinical/Internship Hours: 0

Required Materials

Textbook:

Radiobiology for the Radiologist. Hall, E. & Giaccia, A. (2012). 7th Edition. Lippincott, Williams & Wilkins. ISBN: 9781608311934

Other Required Materials:

Internet Access

Course Outcomes

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

- Identify components of human cell and describe their function.
- Define LET, RBE, and influencing factors.
- Describe biologic effects at the sub-cellular level.
- Define and identify somatic and genetic radiation effects.
- Explain the cell survival curve and define its components.
- Identify and define the various radiation syndromes.
- Discuss the role of oxygen in malignant tumors.
- List and define the 4 R's of Radiobiology.
- Define and discuss the significance of fractionation

Topical Description

1	Review Class Expectations Review of Cellular Biology Physics of Radiation Absorption
2	Absorption of Neutrons, Protons and Heavy Ions DNA Mechanics, Damage and Repair Cell Cycle
3	Cell Survival Curves
4	LET and RBE
5	Clinical Response of Normal Tissues
6	Fractionated Radiation Oxygen Effect
7	Radioprotectors Dose-Response Relationships Acute Radiation Syndrome
8	Time, Dose and Fractionation in Radiotherapy (4Rs)
9	Radiation Carcinogenesis
10	Heritable Effects Effects on Embryo and Fetus
11	Retreatment after Radiotherapy
12	Alternative Radiation Modalities New Radiation Therapy Technologies
13	Chemotherapeutic Agents Chemotherapy Basics for Radiotherapists

Note to Instructors