Virginia Western Community College
ROC 243
Dosimetry Planning

Prerequisites
ROC 110, MTH 161

Course Description
   Introduces clinical dosimetry and treatment planning to include, various treatment techniques, calculations, equations, and beam arrangements.

Semester Credits: 2   Lecture Hours: 2 Lab/Clinical/Internship Hours: 0

Required Material:
   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

Textbbook:
Bentel, Gunilla C. 1996. *Radiation therapy planning*. (2nd ed.). New York: Mc-Graw Hill. ISBN: 0-07-005115-1

Course Outcomes

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

1. Define various terms referring to treatment technique.
2. Using various treatment prescriptions, perform percent depth dose calculations for treatment time, given dose, and entrance and exit doses.
3. Discuss factors affecting percent depth dose, tissue air ratio, and tissue maximum ratio.
4. Define wedge and hinge angles and discuss the purpose of wedges.
5. Discuss the methods used to weight treatment fields.
6. Describe influencing factors for an isodose curve.
7. Locate correct isodose curves given specific treatment parameters.
8. Perform dose calculations for the gap technique.
9. Discuss influencing and modifying parameters of moving beam therapy on dose distribution.
10. Discuss the parameters influencing the summation curves for various multiple beam techniques.

Topical Description

 Chapter 9 - Topics to be covered:

- Dose distribution and scatter analysis
- Depth dose distribution
- Depth of maximum build up and dependence on energy, distance, and field geometry

- Concepts regarding isocentric treatment
- Derivation and dependence of TMR's
- Irregular field calculations

Chapter 10 – Topics to be covered:

- Dose calculation parameters to include percent depth dose, tissue maximum ration, scatter maximum ration, collimator and phantom scatter, monitor unit calculations for SSD and SAD set ups, and homogenous and heterogeneous set ups

Chapter 11 – Topics to be covered:

- Characteristics of a single isodose curve
- Concepts of off-axis ratios
- Penumbra
- Isodose in build-up region
- Measurement techniques for isodose curves
- Modification of isodose curves
- Wedges
- Beam blocking
- Combination and summation of isodose curves
- Single fields
- Parallel opposed fields
- 3 fields
- 4 fields
- Wedge pair treatment
- Definitions: GTV, CTV, PTV

Chapter 12 – Topics to be covered:
- Imaging techniques
- Portal imaging
- Cone Beam
- OBI
- Heterogeneity corrections
- Obliquity corrections

Chapter 13 – Topics to be covered:

- Gap analysis