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

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

Washington, Leaver, Trad. 2021. *Washington and Leaver's Principles and Practice of Radiation Therapy* (Fifth Edition). Elsevier, Inc. ISBN: 978-0-323-59695-4

Additional Resources:

Leia Levy. 2011. *Mosby's Radiation Therapy Study Guide and Exam Review*. Mosby, Inc. ISBN: 978-0-323-06934-2

Laura Nappi. 2021. *Radiation Therapy Calculations Manual.* ISBN-13: 9798784161482

Van, Arazie, Sutton. 2010. *Radiation Therapy Essentials (Board Preparation Tool).* RadOnc Publications. ISBN: 978-0-615-41665-6.

Course Outcomes

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

Treatment Planning:

- Define basic dosimetry and plan terminology.
- Discuss all components of 3D CRT planning and the different types of plans.

- ♦ Basic understanding of all steps involved in creating a 3D CRT plan.

Dosimetry Planning:

1. Define various terms referring to treatment technique.
2. Calculate Equivalent Squares.
3. Calculate Irregular Fields.
4. Calculate Extended Distance.
5. Calculate to Off Axis point.
6. Perform Inverse Square Calculation.
7. Using various treatment prescriptions, perform percent depth dose calculations for treatment time, given dose, and entrance and exit doses.
8. Discuss factors affecting percent depth dose, tissue air ratio, and tissue maximum ratio.
9. Define wedge and hinge angles and discuss the purpose of wedges.
10. Discuss the methods used to weight treatment fields.
11. Describe influencing factors for an isodose curve.
12. Locate correct isodose curves given specific treatment parameters.
13. Perform dose calculations for the gap technique.
14. Discuss influencing and modifying parameters of moving beam therapy on dose distribution.
15. Discuss the parameters influencing the summation curves for various multiple beam techniques.
16. Discuss inhomogeneity correction factors.
17. Perform Gap Calculation.

Topical Description

Washington and Leaver's Principles and Practice of Radiation Therapy

Chapter 22 - Topics to be covered:

- Concepts Used in Photon Beam Dose Calculations.
- Tissue Absorption Factors.
- Applications of Photon Beam Dose Calculations.
- Source-Skin Distance Calculations.
- Linear Accelerator Nonisocentric Monitor Unit Setting Calculations.
- Extended Distance Calculation with Percentage Depth Dose and Source-Skin Distance Treatment.
- Source-Axis Distance (Isocentric) Calculations.
- Unequal Beam Weighting.
- Separation of Adjacent Fields.

Chapter 23 – Topics to be covered:

- Photon Dose Distributions.
- Treatment Planning Essentials.
- The Three-Dimensional Treatment Planning Process.

ADA Statement (PDF)

Title IX Statement (PDF)