

El Paso Community College

Syllabus

Part II

Official Course Description

SUBJECT AREA	<u>Radiation Therapy Technology</u>
COURSE RUBRIC AND NUMBER	<u>RADT 2307</u>
COURSE TITLE	<u>Dosimetry I</u>
COURSE CREDIT HOURS	<u>3 2 : 2</u> Credits Lec Lab

I. Catalog Description

Presents the principles, aims and techniques of applying ionizing radiation to the human body. Includes topics on discussions of applications of radiotherapy equipment with emphasis on treatment planning and dose calculations. Discusses the physical aspects and properties of ionizing radiation. A grade of a "C" or better is required to take the next course. **(2:2). Lab fee.**

II. Course Objectives

Upon satisfactory completion of this course, the student will be able to:

- A. Unit I. Clinical Radiation Generators and General Principles
 - 1. Describe contact therapy
 - 2. Explain the use of superficial therapy
 - 3. Describe ortho voltage therapy and its functions
 - 4. Identify the energy range for super voltage therapy
 - 5. Identify and describe the components of a linear accelerator
 - 6. Explain the use of a teletherapy CO-60 unit
 - 7. Define the term penumbra
 - 8. Calculate for geometric penumbra
 - 9. Identify the different types of particle beams

- B. Unit II. Measurements of Absorbed Dose
 - 1. Identify the roentgen as a unit of exposure
 - 2. Define absorbed dose and its SI unit
 - 3. Describe electronic equilibrium
 - 4. Explain the use of the f factor
 - 5. Discuss the use of thermoluminescence dosimetry

- C. Unit III. Dose Distribution and Scatter Analysis
 - 1. Discuss the importance of phantoms in dose distribution
 - 2. Define percentage depth dose and give its function
 - 3. Explain Equivalent Square
 - 4. Discuss the use of Mayneord's F Factor
 - 5. Explain the concept of Tissue-Air ratio
 - 6. Compare backscatter factor to TAR
 - 7. Explain the concept of Scatter Air Ratio
 - 8. Utilize the Clarkson Method for irregular field calculation

- D. Unit IV. A System of Dosimetric Calculations
 - 1. Define collimator scatter factor

2. Define phantom scatter factor and explain how it relates to output factor
 3. Describe the use of Tissue Phantom Ratio
 4. Explain the different properties of Tissue Maximum Ratio
 5. Discuss the similar triangles as it relates to field size and magnification.
- E. Unit V. Isodose Distribution
1. Define an Isodose chart
 2. Explain how Isodose curves are measured
 3. Discuss the different parameters of Isodose curves
 4. Describe wedge filters and their effect on Isodose curves
 5. Explain wedge transmission factor
 6. Describe different wedge systems
 7. Explain the advantage of parallel-opposed fields
 8. Discuss the importance of multiple fields
 9. Describe isocentric techniques
 10. Describe wedge field techniques
 11. Define target volume, treatment volume, maximum target dose, and hot spots
- F. Unit VI. Patient Data, Corrections, and Setup
1. Discuss methods of acquiring patient data.
 2. Describe the function of a treatment simulator.
 3. Discuss methods of treatment verification.
 4. Discuss methods for correlating contour irregularities.
 5. Discuss corrections for tissue inhomogeneities.
 6. Explain different types of tissue compensators.
 7. Discuss methods of patient positioning.

III. THECB Learning Outcomes (WECM)

1. Identify radiotherapeutic delivery systems.
2. Calculate therapeutic dosages.
3. Apply basic treatment planning concepts.

IV. Evaluation

- A. Methods:
1. Assignments/quizzes
 2. Unit examinations
 3. Comprehensive final examination
- B. Grading Scale:
- | | | | | |
|--------------|---|-----|---|---|
| 93 | - | 100 | = | A |
| 85 | - | 92 | = | B |
| 75 | - | 84 | = | C |
| 74 and below | | | = | F |

V. Disability Statement (American with/Disabilities Act [ADA])

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Rm C-112 (831-2426); TM Rm 1400 (831-5808); RG Rm B-201 (831-4198); NWC Rm M-54 (831-8815); and MDP Rm A-125 (831-7024).

VI. 6 Drop Rule

Students who began attending Texas public institutions of higher education for the first time during the Fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.