El Paso Community College
Syllabus
Part II
Official Course Description

SUBJECT AREA	**Radiation Therapy Technology**
COURSE RUBRIC AND NUMBER	**RADT 2309**
COURSE TITLE	**Dosimetry II**
COURSE CREDIT HOURS	**3 2 : 2** **Credits Lec Lab**

I. Catalog Description

Provides a continuation of Dosimetry I the principles, aims, and techniques of applying ionizing radiation to the human body are presented in the course. Includes topics on the discussion of applications of radiotherapy equipment with emphasis on treatment planning and dose calculations. A grade of a "C" or better is required to take the next course. **Prerequisite: RADT 2307. (2:2). Lab fee.**

II. Course Objectives

A. Unit I. Field Shaping, Skin Dose, and Field Separation
1. Discuss the importance of field blocks.
2. Explain block thickness and block divergence.
3. Describe the name and the materials used for field shaping.
4. Discuss independent jaws and multileaf collimators as other systems for field shaping.
5. Explain skin dose as it relates to different energies and how it is affected by electron contamination.
6. Discuss skin sparing as a function of photon energies.
7. Describe the effect of absorbers as it relates to skin distance.
8. Discuss how field size, electron filters, and oblique angles affect skin dose.
9. Explain different methods of field separation.
    1. Geometic
    2. Dosimetric
10. Describe Orthoganal Field Junctions for craniospinal fields.

B. Unit II. Electron Beam Therapy I
1. Describe electron interactions in a medium.
2. Discuss the rate of energy loss by an electron in a medium.
3. Determine output calibration for electron energies.
4. Describe depth dose distribution in electron beams.
5. Explain the use of phantoms in electron beams.
6. Discuss characteristics of clinical electron beams for various energies.
7. Calculate the "rule of thumb" percentage depth dose for practical range 50%, 80%, and 90% lines for various electron energies.
8. Discuss the scattering of electrons and the important role it plays in determining the shape of the Isodose curves.

C. Unit III. Electron Beam Therapy II
1. Describe how energy and field size are selected for electron therapy.
2. Discuss corrections of air gaps and beam obliquity in electrons.
3. Explain the dose distribution in the presence of tissue inhomogeneities in electron beams.

4. Describe the use of bolus and absorbers in electron therapy.
5. Discuss problems in adjacent fields.
6. Describe how electron shielding materials should be arranged for external vs internal shielding.
7. Discuss electron therapy and its techniques.
8. Explain the use of electrons in total skin irradiation.

D. Unit IV. Brachytherapy I
1. Discuss the history of the most commonly used isotopes in brachytherapy.
2. Identify the physical characteristics of radionuclides used in brachytherapy.
3. Explain the use of exposure rate constant in brachytherapy.
4. Describe radium sources' specifications and construction.
5. Discuss specification of source strength for brachytherapy sources.
6. Describe the National Institute of Standards and Technology (NIST) relationship in brachytherapy.
7. Discuss calculation for dose distribution in brachytherapy.

E. Unit V. Brachytherapy II
1. Describe different systems of implant dosimetry.
    a. Paterson Parker
    b. Quimby System
    c. Paris System
2. Discuss different methods of localization of sources.
3. Describe several implantation techniques use in brachytherapy.
4. Discuss dose specification in cancer of the cervix and how brachytherapy is a useful treatment.
5. Explain the advantages and disadvantages of remote after loading units.

F. Unit VI. Modern Radiation Therapy
1. Discuss the process of three-dimensional conformal radiation therapy.
2. Describe intensity modulated radiation therapy as an emerging technology.
3. Discuss the procedure and equipment used to deliver stereotactic radiosurgery.
4. Explain the procedure and equipment necessary for Intravascular Brachytherapy.

III. THECB Learning Outcomes (WECM)

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

IV. Evaluation

A. Methods of Evaluation

Unit Examinations
Comprehensive Final Exam

B. Grading Scale

93 - 100 =A
85 - 92 =B
75 - 84 =C
74 and below =F

A grade of 75% or above is required to successfully complete this course.

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.