

El Paso Community College
Syllabus
Part II
Official Course Description

SUBJECT AREA	Medical Imaging Technology- Radiography
COURSE RUBRIC AND NUMBER	RADR 2333
COURSE TITLE	Advanced Medical Imaging
COURSE CREDIT HOURS	3 2 : 4 Credits Lec Lab

I. Catalog Description

Explores specialized imaging modalities. Includes concepts and theories of equipment operations and their integration for medical diagnosis. A grade of "C" or better is required in this course to take the next course. **(2:4). Lab fee.**

II. Course Objectives

- A. Unit I – The X-ray Tube
 - 1. Describe six support designs for the x-ray tube. A4, F1, F3
 - 2. List the protective components of the tube housing. A2, F2
 - 3. Identify the components of the glass or metal envelope that comprise the x-ray tube. B2, F3, G1
 - 4. Discuss cathode and filament current. A4, F1
 - 5. Describe the parts of the anode and the induction motor that spins the rotating anode. A4, F1
 - 6. Identify the three causes of x-ray tube failure. B2, F3, G1
 - 7. Explain the use of tube rating charts to prevent tube failure. A4, F1, F3

- B. Unit II - Fluoroscopy
 - 1. Discuss the history of fluoroscopy. A4, F2, F3
 - 2. Explain visual physiology in relation to fluoroscopic illumination. A4, F1, F3
 - 3. Describe the parts of the fluoroscopic image intensifier. A4, F1, G1
 - 4. Calculate flux gain and brightness gain. A3, B3
 - 5. List the approximate kVp levels for seven common fluoroscopic examinations. A2, F2
 - 6. Discuss the role of the television monitor and television image in forming the fluoroscopic image. A4, F1, G1

- C. Unit III – Angiography & Interventional Radiography
 - 1. State the meaning of the initials RT (CV) (ARRT). A4, F1
 - 2. Discuss the Seldinger technique for vascular access. A4, F1
 - 3. Describe the most common route of vascular access. A4, F1
 - 4. List the four sections of an angiographic catheter. A2, F2
 - 5. Name the four catheters most commonly used in angiointerventional radiography. A4, F1
 - 6. Discuss the type of contrast media most often in used today during angiointerventional procedures. A4, F1
 - 7. List the step-by-step preparation and monitoring of a patient having an angiointerventional procedure. A2, F2
 - 8. Name the three risks of arteriography. A4, F1
 - 9. Describe the five types of equipment in the angiointerventional suite. A4, F1

- D. Unit IV – Digital X-ray Imaging
1. Discuss the frequency of use of digital imaging in modern diagnostic imaging departments. A4, F1
 2. Relate the research and development of digital imaging. A4, F1
 3. Explain the characteristics of digital images, specifically image matrix and dynamic range. A4, F1, F3
 4. Describe the parts of a digital fluoroscopy system and their functions. A4, F1, G1
 5. Discuss the components and use of a digital radiography system. A4, F1, G1
 6. Explain the picture archiving (PACS, Radiology Information System and Hospital Information Systems) and teleradiology systems used in diagnostic imaging departments. A4, F1, F3
 7. Demonstrate computer literacy proficiency in order to operate various digital, medical documentation, and image acquisition systems.
- E. Unit XIII – Special Procedures
1. Perform long bone measurement
 2. Analyze the radiographic image protocols prescribed on child abuse cases.
 3. Explain the technical concept of tomographic and panoramic (Panorex) images.
 4. Evaluate radiographic images for metastatic disease.
 5. Assess medical images produced to evaluate bone age development.
 6. Review proper imaging techniques to evaluate line, tubes, and shunt placement.
- F. Unit VI – Introduction to Computed Tomography
1. Discuss the concepts of transaxial tomography, translation, and reconstruction of images. A4, F1
 2. List and describe the five generations of CT scanners. A2, F2
 3. Relate the CT system components and their functions. A4, F1
 4. Describe CT image characteristics of image matrix and CT numbers. A4, F1
 5. Review image reconstruction. A4, F1, F3
 6. Discuss image quality as it relates to spatial resolution, contrast resolution, system noise, linearity, and spatial uniformity. A4, F1
- G. Unit VII – Mammography
1. Discuss the differences between soft tissue radiography and conventional radiography.
 2. Discuss the advantages of mammographic compression.
 3. Describe the composition of the tube target in a mammographic unit.
 4. Indicate tube filtration used in mammography.
 5. List the grid ratio and line pairs per millimeter used in a mammographic grid.
 6. Describe the image receptors used in mammography.
- H. Unit VIII – Mobile Radiography
1. Principles of Mobile Radiography
 2. Mobile X-Ray Machines
 3. Technical Considerations
 4. Radiation Safety
 5. Isolation Considerations
 6. Performing Mobile Examinations
- I. Unit IX – Geriatric Radiography
1. Demographics and Social Effects of Aging
 2. Elder Abuse
 3. Attitudes toward the Older Adult
 4. Physical, Cognitive, and Psychosocial Effects of Aging
 5. Physiology of Aging
 6. Radiographic Positioning for Geriatric Patients

- J. Unit X – Bone Densitometry
 - 1. Comprehend the basic principles of bone densitometry
 - 2. Define bone biology and remodeling
 - 3. Understand acquisition techniques
 - 4. Identify osteoporosis
 - 5. Use physical and mathematical principles of x-ray absorptiometry

- K. Unit XI – Diagnostic Medical Sonography
 - 1. Describe the fundamental principles of DMS
 - 2. Explain the physical principles of DMS
 - 3. Cite diagnostic and cardiac applications of DMS
 - 4. Define terms related to DMS

- F. Unit XII – Surgical Radiography
 - 1. Identify the surgical team
 - 2. Explain fluoroscopic procedures in the operating room.
 - 3. Discuss radiation exposure during surgery
 - 4. Identify asepsis and OR attire
 - 5. Describe surgical procedures
 - 6. List and analyze the role of the radiographer in the OR

III. THECB Learning Outcomes (WECM)

Upon completing this course, the student will be able to:

- 1. Describe the various specialized imaging modalities.
- 2. Differentiate between images produced by different modalities and identify the anatomy demonstrated.

IV. Evaluation

A. Methods

- 1. Written assignments and quizzes
- 2. Unit examinations
- 3. Comprehensive final examination

B. Grading Scale

93	-	100	=	A
85	-	92	=	B
75	-	84	=	C
65	-	74	=	D
64 & below			=	F

A total final course grade of below C (i.e., less than 70%) is not acceptable for completion of this course.

C. Final Grade Determination

The final grade determination for this course is calculated as follows:

Written assignments & quizzes	10% toward final grade
Unit examinations	60% toward final grade
Comprehensive final examination	<u>30% toward final grade</u>
TOTAL	100%

V. Disability Statement (Americans 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.

VII. Title IX and Sex Discrimination

Title 9 (20 U.S.C. 1681 & 34 C.F.R. Part 106) states the following "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any educational program or activity receiving Federal financial assistance." The Violence Against Women Act (VAWA) prohibits stalking, date violence, sexual violence, and domestic violence for all students, employees and visitors (male and female). If you have any concerns related to discrimination, harassment, or assault (of any type) you can contact the Assistant to the Vice President for Student and Enrollment Services at 915-831-2655. Employees can call the Manager of Employee Relations at 915-831-6458. Reports of sexual assault/violence may also be reported to EPCC Police at 915-831-2200.