

## Introduction to Radiology and Patient Care (RADR 1309)



**Credit:** 3 semester credit hours (2 lecture and 3 lab hours)

**Pre-requisite:** Acceptance in the Medical Radiologic Technology Program

### Course description:

An overview of the historical development of radiography, basic radiation protection, an introduction to medical terminology, ethical and legal issues for health care professionals, and an orientation to the program and to the health care system. Patient assessment, infection control procedures, emergency and safety procedures, communication and patient interaction skills, and basic pharmacology are also included.

### Purpose:

To introduce the student to the field of radiology. Included in this course will be history, organization, production of x-rays, radiation protection, darkroom techniques, digital imaging, terminology, and examinations performed within the radiology department.

### Textbook And Materials:

- Adler, Carlton, *Introduction to Radiographic and Patient Care*, 4<sup>th</sup> edition, Saunders, 2007 ISBN#1-4160-3194-4
- #882 Scan Trons and pencil

### Course Objectives

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

1. Define basic medical terms
2. Identify ethical and legal standards (F10)
3. Explain basic radiation protection practices (C18)
4. Assess patient conditions. (C4, C9, F5, F15)
5. Recognize emergency situations and identify appropriate response. (C4, C20, F8, F9, F14)
6. Identify relevant pharmaceuticals and their applications. (F5, F11)

### SCANS Skills and Competencies:

Beginning in the late 1980's, the U.S. Department of Labor Secretary's Commission on Achieving Necessary Skills (SCANS) conducted extensive research and interviews with business owners, union leaders, supervisors, and laborers in a wide variety of work settings to determine what knowledge workers needed in order to perform well on a job. In 1991 the Commission announced its findings in *What Work Requires in Schools*. In its research, the Commission determined that "workplace know-how" consists of two elements: foundation skills and workplace competencies.

### Course Outline Lecture:

- I. History of Radiology
  - a. Important people and their discoveries

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- b. American Society Radiologic Technologists
  - c. Imaging equipment
  
- II. Role of Each Member in the Radiology Team
  - a. Diagnostic department
  - b. Special modalities
  - c. Employment opportunities
  - d. Hospital Organizational Chart
  - e. Professional, accrediting, and credentialing agencies
  
- III. Radiology Ethics & Law
  - a. Professional ethics
  - b. Professional etiquette
  - c. Patient Care Partnership
  - d. Professional Standards of Conduct
  - e. Legal terms
  
- IV. Health Record
  - a. HIPPA
  - b. Hospital Information Systems
  
- V. Radiation Physics
  - a. Atomic Structure
  - b. Electromagnetic Radiation
  - c. Production of Radiation
  - d. Image Production Equipment
  
- VI. Fundamentals of Radiographic Exposure
  - a. MA
  - b. Time
  - c. Distance (Inverse Square Law)
  - d. Density (Square Law)
  - e. KVP (15% rule)
  - f. Contrast
  - g. Geometric Factors
  
- VII. Image Formation and Quality Control
  - a. Film
  - b. Screens
  - c. Grids
  - d. Beam Restrictors
  - e. Filtration
  - f. Darkroom Equipment
  - g. Digital Imaging

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- VIII. Radiation Biology
  - a. Sources of radiation
  - b. Cell radiosensitivity
  - c. Radiation effects
  - d. Radiation units
  
- IX. Radiation Protection
  - a. Principles of radiation protection
  - b. Types of radiation monitors

### **Course Outline Lab:**

- I. Introduction and description of the Lab
  
- II. Moving and Transferring Patients
  - a. Body Mechanics
  - c. Positioning the Patient for Examinations
  - d. Transfer of Patients
  - e. Immobilization Devices
  
- III. Vital Signs
  - a. Temperature
  - b. Pulse
  - c. Respiration
  - d. Blood Pressure
  - e. O<sup>2</sup> administration
  - f. EKG demonstration
  
- IV. Medical Asepsis and Infection Control
  - a. Handwashing
  - b. Sterile Technique
  - c. Protection of Self and Others
  - d. Cleaning
  - e. Isolation
  
- V. Medical Emergencies
  - a. Respiratory Failure
  - b. Cardiac Failure
  - c. Airway Obstruction
  - d. Diabetic Patient
  - f. Shock
  - g. Stroke
  
- VI. Care of Special Patients
  - a. Pediatrics
  - b. Geriatrics

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- c. Contrast Media Exams

VII. Contrast Media

- a. Types of contrast media
- b. Selection criteria

VIII. Contrast and Drug Preparation, Injections and Venipuncture

- a. Draw contrast media
- b. Venipuncture
- c. Pharmacology

IX. Radiology Equipment, Film Exposure and Processing

- a. Expose and process images

X. Radiographic Identification

- a. Chest
- b. Abdomen
- c. Extremities
- d. Spines

XI. Contrast Exams

**Grade Scale:**

The final grade will be determined by taking an average of all tests (2) and the final examination.

100 - 93 = A

84 - 92 = B

75 - 83 = C

66 - 74 = D \*

65 & BELOW = F\*

**\* STUDENTS SCORING BELOW A 75 WILL NOT BE ALLOWED TO PROGRESS WITHIN THE RADIOLOGY PROGRAM.**

**Course Evaluation:**

Grades will be determined from an average of *two major tests* and a *comprehensive final*. Lab will be graded on a Pass\Fail basis. There will be six task that will have to be completed and signed off on by an instructor for the student to pass the course. **All check offs should be completed by Aug. 9, 2010.**

**Students not completing the assignments for lecture and lab will be given an incomplete in the course and will not progress within the radiology program!**

**Course Requirements:**

1. **REPORTS** -- Each student will be required to report on **three** current events/news releases. These may be obtained from newspapers, internet, or medical journals. The current event or newsrelease must be related to the field of radiology (diagnostic, radiation therapy, CT, sports medicine...). Write a summary report of the current event using Who? What? When? Where? Why/How? Style format. Include a paragraph about your feelings on the information: is it a good idea, bad idea, how can you implement into your career... Provide a copy of the article and bibliographical information of the source (author, title, date of publication, name of journal, newspaper, magazine, or URL for web information). **Reports are due August 9, 2010.** *If the report is not turned in or is incomplete **two (2) points** will be taken off the final exam for each class the reports are late.*
2. **CPR** - must be completed prior to completion of RADR-1309. If you take CPR outside of LIT, it must be **Health Care Provider CPR**. CPR will be offered here in the radiology lab on certain **FRIDAY's**. The cost will be \$25. This must be paid with *cash*. See Mrs. Barrow to pay your fee and sign up ASAP!!!
3. **PHYSICAL** – the provided physical form must be completed and returned by **August 9, 2010**. A copy of your shot record and proof of Hepatitis B vaccine and TB vaccine must be turned in with the physical.
4. **MALPRACTICE INSURANCE** – Money Order \$18.13 Bill Beatty Insurance (may leave blank if you are an alternate) must be turned in by **August 9, 2010**.

**Course Policies:**

1. No food, drinks, or use of tobacco products in class.
2. Beepers, telephones, headphones, and any other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. Attendance Policy: Class attendance is important to ensure that a student receives the knowledge and skills necessary to be successful in the Radiologic Technology program. Students are expected to be in class on time. If a student is tardy they may enter only if they do so quietly.

When it becomes necessary to miss a session, it is the responsibility of the *student* to contact the instructor and to inquire about assignments. I will not distribute the PowerPoints missed. The student must get the notes from a classmate. If a major test is missed, the test will be administered at the first day the student returns to class or at a time designated by the instructor. There will be a ten (10) point reduction for make-up exams.

**Disabilities Statement:**

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

**Course Schedule:**

**SUMMER SESSION II 20010**  
**LECTURE CONTENT (8:00 -9:20)**

**JULY 12,** INTRODUCTION TO COURSE & HISTORY OF X-RAY, *ASSIGNMENT: CH. 1*

**JULY 13,** MEMBERS OF THE RADIOLOGY & HEALTH PROFESSIONS TEAM, *ASSIGNMENT: CH. 2 & 6*

**JULY 14,** MEDICAL ETHICS AND LAW, *ASSIGNMENT: CH. 22 & 24 (case studies)*

**JULY 15,** INFECTION CONTROL & MEDICAL ASEPSIS (LECTURE & DEMO), *TAPE (Blood-born Pathogens 12MIN.), ASSIGNMENT: CH. 16, 17 & 18*

**JULY 19,** RADIOGRAPHIC PHYSICS

**JULY 20,** RADIOGRAPHIC TUBE & X-RAY PRODUCTION, *ASSIGNMENT: CH 7 & 8*

**JULY 21,** *TEST 1*

**JULY 22,** TEST REVIEW

**JULY26,** PRIME FACTORS & INVERSE SQUARE LAW *ASSIGNMENT: CH. 7 & 8*

**JULY 27,** KVP, CONTRAST & DENSITY *ASSIGNMENT: CH. 7 & 8*

**JULY 28,** RADIOGRAPHIC IMAGE FORMATION (PROCESSING & DIGITAL) *ASSIGNMENT: CH. 7 & 8*

**JULY 29,** GEOMETRIC FACTORS, *ASSIGNMENT: CH. 7 & 8*

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**AUG 2**, IMAGE ACCESSORIES (SCREENS, GRIDS, & EQUIPMENT)  
*ASSIGNMENT: CH. 7 & 8*

**AUG 3**, **TEST II**

**AUG 4**, TEST REVIEW & INTRODUCTION TO RAD. BIOLOGY, *ASSIGNMENT CH. 9*

**AUG 5**, RADIATION BIOLOGY & PROTECTION CONT.

**AUG 9**, CHEST & ABDOMEN POSITIONING (***REPORTS, MONEY ORDER, PHYSICALS, CPR ARE DUE!!!***)

**AUG 10**, HANDBOOK REVIEW

**AUG 11**, DARKROOM DEMONSTRATION, TAKING & PROCESSING RADIOGRAPHS, (***CHECK-OFF***) (*both lecture and lab*)

**AUG 12** **FINAL 8:00**

**LAB CONTENT 2010 (9:25 – 11:20)**

**JULY 12** INTRODUCTION TO LAB, BODY MECHANICS, PATIENT TRANSFER, & IMMOBILIZATION (LECTURE & DEMO), *ASSIGNMENT: CH. 13 & 14* (**CHECK-OFF**)

**JULY 13**, POSITIONING TERMS & RADIOGRAPHS OF CHEST AND UPPER EXTREMITIES, *ASSIGNMENT: HAND-OUT*

**JULY 14**, INTRODUCTION TO VITAL SIGNS (LECTURE & DEMO), *ASSIGNMENT: CH. 15*

**JULY 15**, BLOOD PRESSURE (**CHECK-OFF**)

**JULY 19**, HEALTH RECORD, *ASSIGNMENT: CH. 23*

**JULY 20**, PRACTICE RADIOGRAPH TEST

**JULY 21**, *NO LAB*

**JULY 22**, PHARMACOLOGY & ASSISTING WITH DRUG ADMINISTRATION  
*ASSIGNMENT: CH. 20*

**JULY 26**, VENIPUNCTURE & IV INSERTION (**CHECK OFF**)

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**JULY 27** ABDOMEN & LOWER EXTREMITY RADIOGRAPHS, *ASSIGNMENT: HAND-OUT*

**JULY 28**, MEDICAL EMERGENCIES, *ASSIGNMENT: CH. 19*

**JULY 29**, RESPIRATORY O2 AND EKG DEMO

**AUG 2**, PRACTICE RADIOGRAPH TEST

**AUG 3**, *NO LAB*

**AUG 4**, CONTRAST MEDIA & RADIOGRAPHS OF CONTRAST STUDIES,  
*ASSIGNMENT: CH. 21 & HAND-OUT*

**AUG 5**, RADIOGRAPHS OF SPINES, *ASSIGNMENT: HAND-OUT*

**AUG 9**, PRACTICE RADIOGRAPH TEST (**ALL CHECK OFFS MUST BE COMPLETE**)

**AUG 10**, DEMONSTRATION OF VARIOUS MEDICAL EQUIPMENT TAKE  
CLASS PICTURES

**AUG 11**, DARKROOM DEMONSTRATION, TAKING & PROCESSING  
RADIOGRAPHS, (***CHECK-OFF*** )

**INSTRUCTOR:** *Brenda A. Barrow, M.Ed., R.T., Office 232 MPC, Phone 880-8848,  
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