



RADR 2217 RADIOGRAPHIC PATHOLOGY

CREDIT: 2 semester credit hours (1 lecture and 2 lab)

PREREQUISITE: RADR 1411 Basic Radiographic Procedures

COURSE DESCRIPTION: Disease processes and their appearance on radiographic images.

REQUIRED TEXTBOOK and MATERIALS:

- Eisenberg, Ronald: *Radiographic Pathology*, 5th edition, Mosby Inc., 2012. ISBN# 978-0-323-07847-4
- Medical Dictionary
- #882 Scan-trons and pencils

COURSE OBJECTIVES:

By the end of the semester of instruction the student will be able to:

1. Classify types of diseases.
2. Explain the pathogenesis of common diseases.
3. Differentiate between normal and abnormal radiographic findings.
4. Correlate normal and abnormal radiographic findings.
5. Acquaint the student radiographer with basic medical terminology used to describe various conditions occurring in the human body.
6. Introduce the student to various specialized imaging techniques.
7. Use computer skills in preparing a case presentation.

COURSE OUTLINE:

I. CHAPTER 1: Introduction to Pathology

- A. classify the more common diseases in their attenuation of x-rays
- B. determine the technical factor changes required for obtaining optimal quality radiographs in patients with various pathological conditions
 1. additive diseases
 2. destructive diseases
- C. define disease terminology
- D. classify diseases by their origin
 1. genetic and congenital
 2. acquired and inflammatory
 3. altered cell growth
- E. discuss the causes of disease
 1. endogenous
 2. exogenous
 3. idiopathic
 4. iatrogenic
 5. nosocomial
- F. describe the various immune reactions of the body
- G. discuss the leading causes of death in the United States

H. discuss the leading causes of death in Texas

II. CHAPTER 2: Specialized Imaging Techniques

- A. describe the theory of image production with special modalities and the body structures best demonstrated by each
1. ultrasound
 2. computed tomography
 3. magnetic resonance imaging
 4. positron emission tomography
 5. nuclear medicine

III. Neoplasia

- A. discuss the differences types of altered cell growth
1. atrophy
 2. hypoplasia
 3. hyperplasia
 4. hypertrophy
 5. neoplasia
- B. list the routes of metastasis
1. seeding
 2. lymphatic
 3. hematogenous
- C. describe the different types of cancer
1. carcinoma
 2. sarcoma
 3. lymphoma
 4. leukemia
- D. describe the method classifying a malignancy
1. grading
 2. staging
- E. list the risk factors of cancer using the American Cancer Society pre-screening recommendations
- F. discuss cancer statistics
- G. define some methods of cancer treatment
1. chemotherapy
 2. radiation therapy
 3. surgery
 4. immunotherapy
 5. hormone therapy

IV. CHAPTER 3: Respiratory System

- A. classify the more common diseases in their attenuation of x-rays and the technical factor changes required for obtaining optimal quality radiographs
1. additive disease
 2. destructive disease
- B. describe the physiology and functions of the respiratory system
- C. identify structures on both diagrams and radiographs of the respiratory system
- D. describe pathology of the respiratory system and their radiographic manifestations
1. chronic
 2. acute

- 3. congenital
- 4. inflammatory
- 5. neoplasia
 - a. benign
 - b. malignant

V. CHAPTER 4: Skeletal System

- A. classify the more common diseases in their attenuation of x-rays and the technical factor changes required for obtaining optimal quality radiographs
 - 1. additive disease
 - 2. destructive disease
- B. describe the physiology and functions of the skeletal system
- C. identify structures on both diagrams and radiographs of the skeletal system
- D. describe pathology of the skeletal system and their radiographic manifestations
 - 1. congenital
 - 2. inflammatory
 - 3. neoplasia
 - a. benign
 - b. malignant
 - 4. fractures
 - 5. vertebral disorders
- E. utilize creative thinking skills to alter position of the tube/film/patient during trauma and fracture radiography

VI. CHAPTER 5: Gastrointestinal System

- A. classify the more common diseases in their attenuation of x-rays and the technical factor changes required for obtaining optimal quality radiographs
 - 1. additive disease
 - 2. destructive disease
- B. describe the physiology and function of the gastrointestinal system
- C. identify structures on both diagrams and radiographs of the gastrointestinal system
- D. describe pathology of the gastrointestinal system and their radiographic manifestations
 - 1. esophagus
 - a. congenital
 - b. inflammatory
 - c. neoplasia
 - 1. benign
 - 2. malignant
 - 2. stomach
 - a. congenital
 - b. inflammatory
 - c. neoplasia
 - 1. benign
 - 2. malignant
 - 3. small bowel
 - a. congenital
 - b. inflammatory
 - c. neoplasia
 - 1. benign

- 2. malignant
 - 4. large intestine
 - a. congenital
 - b. inflammatory
 - c. neoplasia
 - 1. benign
 - 2. malignant
- E. be familiar with the special procedures that are used when imaging particular pathologic conditions

VII. CHAPTER 6: Urinary System

- A. classify the more common diseases in their attenuation of x-rays
- B. describe the physiology and function of the urinary system
- C. identify structures on both diagrams and radiographs of the urinary system
- D. describe pathology of the urinary system and their radiographic manifestations
 - 1. congenital
 - 2. inflammatory
 - 3. neoplasia
 - a. benign
 - b. malignant
- E. be familiar with the special procedures that are used when imaging particular pathologic conditions

VIII. CHAPTER 7: Cardiovascular System

- A. describe the physiology and function of the cardiovascular system
- B. identify structures on both diagrams and radiographs of the cardiovascular system
- C. describe pathology of the cardiovascular system and their radiographic manifestations
 - 1. congenital
 - 2. acquired vascular
 - 3. valve disorders
- D. be familiar with the special procedures that are used when imaging particular pathologic conditions

IX. CHAPTER 8: Nervous System

- A. describe the physiology and function of the nervous system
- B. identify structures on both diagrams and radiographs of the nervous system
- C. describe pathology of the nervous system and their radiographic manifestations
 - 1. congenital
 - 2. infections
 - 3. neoplasia
 - a. benign
 - b. malignant
 - 4. trauma
 - 5. vascular
 - 6. degenerative
- D. be familiar with the special procedures that are used when imaging particular pathologic conditions

X. CHAPTER 9: Hematopoietic System

- A. describe the physiology and function of the hematopoietic system

- B. identify basic blood structures on diagrams
- C. describe pathology of the hematopoietic system and their radiographic manifestations
 - 1. RBC
 - 2. WBC
 - 3. Platelets

XI. CHAPTER 10: Endocrine System

- A. describe the physiology and function of the endocrine system
- B. identify structures on both diagrams and images of the endocrine system
- C. describe pathology of the endocrine system and their radiographic manifestations
 - 1. adrenal
 - 2. pituitary
 - 3. thyroid
 - 4. parathyroid
 - 5. pancreas
- D. be familiar with the special procedures that are used when imaging particular pathologic conditions

XII. CHAPTER 11: Reproductive System

- A. describe the physiology and function of the reproductive system
- B. identify structures on both diagrams and images of the reproductive system
- C. describe pathology of the reproductive system and their radiographic manifestations
 - 1. female
 - a. congenital
 - b. inflammatory
 - c. neoplasia
 - 1. benign
 - 2. malignant
 - 2. male
 - a. congenital
 - b. inflammatory
 - c. neoplasia
 - 1. benign
 - 2. malignant
- D. be familiar with the special procedures that are used when imaging particular pathologic conditions

XIII. CHAPTER 12: Miscellaneous Diseases

- A. describe nutritional disorders and their possible relationship to disorders of other organs
 - 1. vitamin deficiencies
 - 2. eating disorders
- B. describe miscellaneous disorders and their relationship to all organs
 - 1. Sarcoidosis
 - 2. Lupus
 - 3. Muscular Dystrophy
 - 4. Melanoma
- C. describe hereditary abnormalities
- D. identify correct tube placement
 - 1. Endotracheal tube

2. Central venous catheter
3. Chest tube
4. Pacemaker

GRADE SCALE: Numeric to letter grade conversion:

A=93=100

B=84=92

C=77=83

D=60=74

F=0-59

A MINIMUM OF 77% IS REQUIRED FOR SUCCESSFUL COMPLETION OF THIS COURSE!

COURSE EVALUATION:

- There will be four (4) major tests and a comprehensive final exam.
- A pathology report and case study will be presented to the class.
- Quizzes and homework will be utilized in this course. If a student misses a quiz it **may not** be made up. Quizzes and homework grades will be averaged for one (1) test grade. Students will be allowed to drop their **lowest** quiz grade at the end of the semester. If more than one quiz is missed a zero (0) will be given. Late homework will be accepted but with a grade penalty. The grade will be reduced by 10 points for each class day it is late.

COURSE REQUIREMENTS:

- | | |
|---|----------------|
| •(4) Major examinations & Quiz/Homework average | 75% (15% each) |
| •Report & Case Presentations | 15% |
| •Comprehensive Final | 10% |

COURSE POLICIES:

- No food, drinks, or use of tobacco products in class.
- Beepers, telephones, headphones, and any other electronic devices must be turned off while in class.
- Do not bring children to class.
- Recording devices may be used except during test reviews and when otherwise stated by the instructor.
- Lap top computers, I-pad...may be used to take notes during class but may not be used to “surf” the internet, look-up answers, nor anything not specifically related to note taking.
- **ATTENDANCE POLICY:**
Each student is responsible for attending every class session. When it becomes necessary to miss a session, it is the responsibility of the **STUDENT** to contact the instructor and to inquire about assignments.

When the student has missed sufficient hours to cause a drop in grade points by missing class discussions, participation, quizzes, major test and or assignments, he/she will be notified in writing by the instructor concerning the possibility of failure in the course.

The student should respond and meet the instructor for counseling.

If a major test is missed the student must request a make-up examination from the instructor. This test will be administered at the first day the student returns to class or at a time designated by the instructor. There will be an automatic **10 point reduction** on the make-up exam.

Technical Requirements (for courses using Blackboard)

The latest technical requirements, including hardware, compatible browsers, operating systems, software, Java, etc. can be found online at:

[https://help.blackboard.com/en-](https://help.blackboard.com/en-us/Learn/9.1_2014_04/Student/015_Browser_Support/015_Browser_Support_Policy)

[us/Learn/9.1_2014_04/Student/015_Browser_Support/015_Browser_Support_Policy](https://help.blackboard.com/en-us/Learn/9.1_2014_04/Student/015_Browser_Support/015_Browser_Support_Policy) A

functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of the online technology and resources.

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. You may also visit the online resource at <http://www.lit.edu/depts/stuserv/special/defaults.aspx>

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document

PATHOLOGY REPORT/CASE STUDY:

Each student will be required to complete a Pathology Report/Case Study. The topic of the report will be chosen by the student and **approved by the instructor**. The report should be **computer generated** using some type of word processing program: Word, WordPerfect... The report should be at least three (3) pages long, double spaced, 12 font. It should **contain four sources** (two of which must be from the internet and one must be from a book). The report should be written in the student's own words and should contain a **title page, reference page, and in-text citations**. The report will be used to evaluate the students writing and computer skills.

The *report* should include the following:

introduction

etiology

specifics or interesting information about disease

methods of diagnosis
manifestations
treatment
prognosis
conclusion

The report section of the grade will be based on *educational value* (does it involve imaging) and *technical value* (grammar, punctuation).

The *case study* portion of the report may be obtained from internet, personal acquaintance, or clinic and should include the following:

patient age and sex (no names)
patient history
explanation of procedures performed
did procedure aid diagnosis
images, radiographs

The student will *orally present* their report and case study to the class to using **PowerPoint**. The Power Point should contain images and explanations of all areas covered in the report and case study. Students should utilize more than one case study (patient) or more than one radiographic procedure to demonstrate how the disease is diagnosed using different modalities. The oral presentation will allow evaluation of the student's communication skills and allow them the opportunity to teach fellow students new information and skills. The presentation should be **five (5) minutes** long.