COURSE SYLLABUS
RT 2540 – RADIOLOGIC PATHOLOGY

CLASS HOURS: 4
LABORATORY HOURS: 0
CREDIT HOURS: 4

CATALOG COURSE DESCRIPTION: Survey of disease related to Radiologic Technology for advanced student radiographer; material based on systems and related organs of the body, stressing studies that make use of radiology; each system discussed according to categories of disease demonstrated by radiography or by another imaging modality; focus on specific pathologic conditions encountered in the major organ systems that require adjustments in exposure factors, patient care and management, and positioning.

ENTRY LEVEL STANDARDS: A grade of “C” or better in all completed radiography courses is required for progression to this course. Having successfully completed all previous didactic and clinical course work, the student should demonstrate the skills and knowledge necessary to begin to exercise independent judgement and discretion in the technical performance of medical imaging procedures. In addition, the student should demonstrate a responsible attitude toward attendance, independent learning activities, class, laboratory, and clinical participation and course preparation.

PREREQUISITE: All previous course material completed in the RT curriculum prior to the Spring semester of the second year.

TEXTBOOK(S) AND OTHER REFERENCE MATERIAL BASIC TO COURSE;
2. Instructor Handouts
3. Taber’s Cyclopedic Medical Dictionary or equivalent

Required Student Learning Outcomes (Program Student Learning Outcomes and Course Student Learning Outcomes):
(PSLO 1-9 are covered in different courses. If a PSLO is not identified here it is not addressed in this course.)

PSLO#3. Apply knowledge of human anatomy, physiology, pathology, positioning and radiographic technique to demonstrate anatomical structures on a radiograph or other imaging receptor utilizing equipment and accessories while maintaining the overall diagnostic quality of radiographs.

CSLO #3  Know how pathology may affect the quality of radiographs and understand the technical and positioning adjustments which must be made to effectively demonstrate pathology. (I, II, III, VI)

CSLO #4  Understand the importance of following prescribed technique for normal anatomy so that pathology will not be simulated or presented in error when none exists. (I, II, III, VI)

PSLO#6. Use acceptable verbal, nonverbal and written medical/conventional communication in patient care intervention and professional relationships in order to promote positive experiences for patients, peers and staff.

CSLO #1  Demonstrate knowledge of terms which are basic to the understanding of pathology. (I, II, III, VI)

CSLO #2  Demonstrate knowledge of specific diseases and disorders that can be diagnosed using radiologic procedures. (I, II, III, VI)

CSLO #6  Demonstrate communication, scientific inquiry, critical thinking, and judgement skills required to perform the responsibilities of an entry-level radiographer. (I, II, III, IV)

PSLO#7. Comply with the Radiologic Technology profession’s code of ethics and scope of practice while demonstrating involvement in professional organizations and activities designed to promote the standards of the profession.

CSLO #5  Understand that the technologist plays a significant and important role in the uncovering of disease and in the proper care and management of patients. (I, II, III, VI)

Other Learning Indicators or Objectives (optional):
The student will be able to:
1. Define the terms health and disease.
2. Define the terms which are emphasized in the introduction. (Refer to course syllabus)
3. List the major classifications of diseases and briefly describe each.
4. Compare the definitions of the terms symptoms and signs and also disease and syndrome.
5. Discuss the relationship and contribution of inheritance and environment to disease.
6. List factors important in our life styles that determine the diseases we are prone to develop.
7. Compare the definitions of the terms infection and inflammation and also metabolic and degenerative.
8. Compare the definitions of the terms benign, malignant, metastasis and also hematogenous and lymphogenous.
9. Identify the basic types of trauma and briefly define and give examples of each type.
11. Compare the definitions of the terms congenital and hereditary and also somatic and genetic.
12. Compare the definitions of the terms ischemia and infarction and also acute and chronic.
13. Identify the common signs of infection or inflammation and define each.
14. List the nine major groups of information that provide the data base for achieving a diagnosis.
15. Compare the relative importance of the clinical history, physical examination and laboratory findings in achieving a diagnosis.
16. List the major components of a clinical history.
17. Know why a family history is important.
18. List the systems of the body and explain why an inquiry is made of each system when gathering the clinical history.
19. Describe the senses used during a physical examination.
20. List the vital signs.
21. List several types of therapy used for treating disease, specifically interventional radiologic procedures.
22. Given the following diseases of the lungs, correctly define each disease and describe the method of differential diagnosis and treatment.
   a. lung contusion
   b. pulmonary embolus
   c. pulmonary edema
   d. alveolar cancer
23. List the factors determining the severity of disease.
24. Describe methods of preventive medicine.
25. Given a particular pathologic condition outlined in the course syllabus or discussed in class, properly classify as to category of disease and give a brief description of each condition.

**Respiratory System (A-E) 75% Minimum Mastery Level Required**
1. Identify the major disease which affect the upper respiratory tract and can be diagnosed radiographically; match them to the appropriate disease category.
2. Describe the protective mechanisms of the upper and lower respiratory tract.
3. Define and describe the major signs and symptoms of respiratory disorders.
4. List common causes of dyspnea.
5. Know what questions pulmonary laboratory tests answer.
6. List laboratory studies commonly employed for studying respiratory disorders.
7. Given a radiograph, diagram or anatomic model, identify and describe the function of the following regions of the upper respiratory tract, and also identify component parts.
   a. Pharynx
   b. Nasopharynx
   c. Oropharynx
   d. Hypopharynx
   e. Larynx
   f. Trachea
8. Correctly describe the proper method of examining the following structures including the positioning, the exposure selection, and breathing maneuvers that are required.
   a. Pharynx
   b. Nasopharynx
   c. Oropharynx
   d. Hypopharynx
   e. Larynx
   f. Trachea
9. Explain how failure to properly extend the neck or to exposure upon swallowing can simulate disease of the pharynx.
10. In examination of the larynx, explain the need for tomography and properly describe the procedure.
11. Define the term laryngography and describe the benefits of the procedure for the diagnosis of lesions of the larynx.
12. Name and describe common birth defects in the respiratory tract which can be demonstrated radiographically.
13. Know why epiglottitis and croup are life-threatening diseases.
14. In terms of most likely age of occurrence, radiographic demonstration and infecting organism, compare epiglottitis and croup.
15. Define the term subcutaneous emphysema.
16. Relative to the respiratory tract, define the terms which are emphasized or discussed. (Refer to course syllabus and handouts.)
17. Describe the typical clinical and pathological findings of respiratory distress syndrome of the newborn.
18. Differentiate atelectasis and pneumothorax.
19. List the possible causes of pneumonia.
20. Given a radiograph, diagram or anatomic model, identify the following regions of the lower respiratory tract, and also identify component parts.
   a. Bronchus
   b. R/L bronchus
   c. Carina (bifurcation or bronchus)
   d. 3 lobes (R)
   e. 2 lobes (L)
   f. Bronchioles
   g. Alveoli
21. Identify the major diseases which affect the lower respiratory tract and can be diagnosed radiographically; match them to the appropriate disease category.
22. Describe the appearance of an acceptable PA and lateral chest radiograph.
23. Explain the reason for positioning the arms to rotate the scapulae laterally in an AP/PA projection of the chest.
24. State the reasons for performing chest radiography erect, 72 inches (FFD).
25. Explain why exposures should be made on the second full inspiration.
26. Describe the method of the image evaluation which identifies rotation of the chest in the a) PA/AP projection; b) in the lateral projection.
27. Explain how fluid level or free air will determine which decubitus projection should be performed.
28. Explain how the lateral decubitus projections may be used to identify aspiration pneumothorax or foreign body aspiration.
29. Explain how an inspiration/expiration chest can be helpful in diagnosing pneumothorax or foreign body aspiration.
30. With respect to the respiratory tract, compare the definition of normal variant and congenital disease and give examples of each.
31. Describe the pathologic features of the lungs of asthmatics.
32. List the disease entities included in the chronic obstructive lung disease group.
33. Describe the posture and appearance of a person with severe emphysema.
34. Describe the pathologic features of the lungs of a person who has emphysema.
35. Define the term pneumoconiosis and give examples. Describe the pathologic features of the lungs of a person who has pneumoconiosis.
36. Define and compare tracheobronchitis and bronchiectasis.
37. Compare the definition of morbidity and mortality.
38. Compare primary and secondary tuberculosis.
39. Describe how lung cancer or benign tumors or cysts of the lungs can be diagnosed without extensive surgical biopsy.
40. Describe the usefulness of the perfusion/ventilation nuclear medicine scan in diagnosing pulmonary emboli.
41. Describe the radiographic exposure adjustment required to correct for pathologic conditions of the respiratory tract.
42. Given a pathologic condition of the respiratory tract, describe the radiographic or pararadiographic method(s) which may be used to effectively demonstrate the pathology.
43. Define sarcoid.
44. Name several examples of simulation of disease in the respiratory tract.

**Gastrointestinal Tract (A-E) 75% Minimum Mastery Level Required**
1. Relative to the gastrointestinal tract, define the terms which are emphasized or discussed. (Lecture or course syllabus.)
2. Identify the major diseases which affect the upper and lower gastrointestinal tract and can be diagnosed radiographically; match them to the appropriate disease category.
3. Given a radiograph, diagram, or anatomic model, identify and describe the function of the following regions of the gastrointestinal tract, and also identify component parts.
   a. Salivary glands
b. Pharynx
c. Esophagus
d. Stomach
e. Small bowel  
   1) Duodenum  
   2) Jejunum  
   3) Ileum  
f. Colon  
g. Appendix  
h. Gallbladder  
i. Pancreas

4. Identify the normal points of narrowing of the esophagus.
5. Give the criterion for judging the quality of a noncontrast abdomen.
6. Explain the need for preprocedure of the gastrointestinal tract.
7. Explain the need to limit exposure time when radiographing the following portions of the GI tract.
   a. Esophagus  
   b. Stomach  
   c. Small bowl
8. Explain the importance of ensuring adequate penetration of the GI tract.
9. In regards to the contrast media barium and oral hypaque or gastrografin, elaborate on/discuss the following topics:
   a. Make up  
   b. Suspension/solvent medium  
   c. Transit item through the GI tract  
   d. Expected radiographic quality when examining the following areas of the GI tract:
      1) Esophagus  
      2) Stomach  
      3) Small bowl  
      4) Colon  
   e. Indication for use  
   f. Contraindications for use  
   g. Complications of use
10. For each of the following structures, describe the benefit of using double contrast of the GI tract and give the typical methods of accomplishing double contrast.
    a. Esophagus  
    b. Stomach  
    c. Small bowl  
    d. Colon
11. Describe the procedure for examination of the esophagus without contrast medium and explain the benefit of exposing the film at the height of the act of swallowing.
12. Give the rationale for only giving the patient a tiny amount of barium in the initial part of the radioscopic examination of the stomach.
13. Give three methods which may be used to radiographically examine the small bowel.
14. Explain the rationale for spot filming the ileocecal region of the small bowel, and the sigmoid region of the duodenal bulb, and flexures of the colon.
15. Give the rationale for a small bowel enema.
16. Describe the diagnostic value of hypnotic duodenography.
17. For intestinal examinations, discuss the complications which can result from over distending the retention balloon of the enema tip.
18. Explain why gas or barium should only be administered under fluoroscopic control of the radiologist.
19. Explain the importance of proper radiographic positioning of the GI tract organs and also explain the importance of properly using the film identification, R and L markers, and time markers.
20. Explain why the left lateral decubitus projection is done of the abdomen when the possibility of intraperitoneal gas is being investigated.
21. Explain the need to include the diaphragm on an upright examination of the abdomen.
22. Give the contraindication for an oral administration of contrast medium to demonstrate the gallbladder and biliary ducts.
23. Give the contraindication for an intravenous administration of contrast medium to demonstrate the gallbladder and biliary ducts. (historical significance only)

24. Give the indications for intravenous administration of contrast medium to demonstrate the biliary tract and/or gallbladder. (historical significance only)

25. Give the indication for direct injection of contrast medium into the biliary ducts.

26. Explain the purpose/benefit of an upright or decub examination of the gallbladder.

27. Identify the noninvasive method of gallbladder and biliary tract examination which gives no radiation exposure to the patient.

28. Describe the two primary radiologic techniques used for examination of the pancreas.

29. Identify pararadiologic modalities which are less invasive and overall better for examining the pancreas, the gallbladder and the liver.

30. Name the pathologic conditions of the pancreas which may be demonstrated with injection of contrast medium.

31. Describe the appearance of inflammation of the pancreas upon injection of a contrast medium.

32. Explain the use of water-soluble non-ionic contrast medium when a perforated viscus or TE fistula is suspected.

33. Define the terms sialoadenitis and sialolithiasis.

34. Describe the etiology of megaesophagus and megacolon (Hirschsprung’s disease).

35. List several congenital obstructive lesions of the GI tract.

36. Define the terms diverticuli and diverticulitis and describe the radiologic method of differential diagnosis.

37. Define the terms hernia, volvulus and intussusception.

38. Define the terms ascariasis and infestation.

39. Describe the clinical and pathological findings of acute appendicitis and describe the radiologic method of demonstrating this condition.

40. Define the term peptic ulcer.

41. List common sites of peptic ulcer.

42. Discuss the pathophysiology of peptic ulcer.

43. List complications of peptic ulcers.

44. List causes of gastrointestinal hemorrhage.

45. Define the term gastritis.

46. Compare Crohn’s disease and ulcerative colitis, and list complications of both disorders.

47. Define the term adenomatous polyp and identify as benign or malignant.

48. Differentiate the terms leiomyoma and leiomyosarcoma.

49. Define the terms pica and bezoar.

50. Define the terms cholecystitis and cholelithiasis.

51. List three major life-threatening diseases of the liver.

52. List the complications possible in a cirrhotic patient.

53. Define the terms esophageal varix, ascites, and cirrhosis.

54. List the three major diseases of the pancreas.

55. Identify cysts, adenomas and carcinomas as common neoplastic lesions of the pancreas.

56. Define the term limitis plastica and explain how the condition is related to stomach cancer.

57. Define the radiologic demonstration of an acute pancreatitis; chronic pancreatitis.

58. Identify the HIDA (hydroxyiminodiacetic acid) scan as a nuclear medicine study of the liver.

59. Name the possible complications of cancer of the GI tract.

The Urinary System and Male Genital Tract (A-E) – 75% Minimum Mastery Level Required
When given a description, diagram or anatomic model of the organs of the urinary system and male genital tract, identify the component structures and be able to describe the function of each component.

1. Relative to the urinary system and the male reproductive system, define the terms which are emphasized or discussed. (lecture and/or course syllabus)

2. Identify the major diseases which affect the urinary and male genital tract and can be diagnosed radiographically; match them to the appropriate disease category.

3. List five major contraindications for the injection of contrast medium for the radiologic examination of the urinary tract.

4. List three relative contraindications for injection of contrast medium for radiologic examination of the urinary tract.

5. Explain the need for getting an accurate patient history before proceeding with a contrast medium injection.

6. Describe the appearance of a correctly exposed abdominal film to visualize the urinary system. Specifically discuss the appropriate kVp and exposure time selection.

7. Describe the proper procedure to be followed by a technologist when a contrast reaction occurs.

8. Describe the disorders which can be diagnosed by radiographic investigation of the seminal ducts.

9. Give the significance of a post-voiding film (IVP) for the detection of prostatic enlargement or ureteral obstruction (i.e.
10. List several pararadiologic modalities which are used in the examination of the kidneys.
11. Relative to radiologic examination of the kidneys, explain the need for proper technique and patient care.
12. Discuss the precautions which should be taken with ureteric compression and the clamping of a catheter.
13. Define the term nephron.
14. List the major signs and symptoms of urinary tract diseases.
15. Define the terms renal failure, azotemia, uremia, and acute tubular necrosis.
16. Describe the two types of renal failure.
17. List the major congenital anomalies of the urinary tract and discuss the implications relative to the prognosis for the patient.
18. Describe the pathogenesis of acute and chronic glomerulonephritis.
19. List several inherited defects of renal structure or function.
20. Describe consequences of obstructed urine flow.
21. Define the terms cystitis and dysuria.
22. Compare acute and chronic pyelonephritis.
23. Describe the symptoms of urolithiasis, and discuss possible treatments.
24. Compare Wilm’s tumor with renal carcinoma.
25. Name the most common cause of acute prostatitis in young men.
26. Discuss the diagnosis and treatment of prostate enlargement.
27. Discuss the diagnosis, treatment, and metastasis of prostatic cancer.
28. Define the term hydrocele.
29. Define the following terms:
   a. Albuminuria
   b. Glycosuria
   c. Hematuria
   d. Pyuria
   e. Ketosis
   f. Casts
   g. Calculi
   h. Micturition
   i. Incontinence
   j. Retention
   k. Anuria
   l. Ptosis
   m. Gout
   n. Glomerulonephritis
   o. Pyelitis
   p. Cystitis
   q. Hemodialysis
   r. Dysuria
   s. Oliguria
   t. Polyuria
   u. Uremia

**Female Reproductive System (A-E) 75% Minimum Mastery Level**
1. Identify the major diseases which affect the female reproductive system and can be diagnosed radiographically; match them to the appropriate disease category.
2. Given a diagram, radiograph, anatomic model or description of the organs of the female reproductive system, identify/locate the organs and be able to describe the function of each organ.
3. Relative to the female reproductive system, define the terms which are emphasized or discussed. (lecture and/or course syllabus)
4. Given the following gynecologic/radiographic examinations, describe them and explain why they would be employed.
   a. hysterosalpingography
   b. vaginography
   c. pelvimetry
5. Explain why gynecologic, radiologic examinations should be scheduled for the seventh or eighth day after the cessation of menstruation.
6. Describe radiation protection precautions which are taken to ensure that the least possible amount of radiation is delivered to the gonads.

7. Explain how a hysterosalpingogram can help to diagnose patency or occlusion of the oviducts and deformity of the uterus.

8. Identify the preferred pararadiologic modality for examination of the female reproductive organs.

9. Explain the need to avoid radiologic examination of a pregnant patient especially until after the first trimester of gestation.

10. Describe the complications accompanying gonorrhea.

11. Define ectopic pregnancy.

12. Recognize why surgical intervention is the only treatment for an ectopic pregnancy.

13. Distinguish hydatidiform mole from a viable pregnancy and choriocarcinoma.


15. Recognize the symptoms and potential consequences of endometriosis.

16. Identify the most common uterine tumor.

17. List the benign and malignant causes of vaginal hemorrhage.

18. Compare the definition of the term leiomyoma and adenocarcinoma.

19. Define the following terms:
   a. placenta previa
   b. placenta accrete
   c. placenta abruption
   d. spontaneous abortion
   e. incomplete abortion
   f. missed abortion
   g. septic abortion
   h. cephalic presentation
   i. breech presentation
   j. frank breech
   k. ovarian cyst
   l. parturition
   m. gravid
   n. nongravid
   o. hydrosalpinx
   p. anencephalic fetus

20. Recognize the relationship between HPV infection and cervical cancer.

21. Understand that vaginal hemorrhage in a postmenopausal woman could signal endometrial cancer.

22. List the major complication accompanying uterine cancer.

23. Know the age distribution of women who develop ovarian cancer.

24. Understand the frequency and significance of bilateral ovarian cancer.

25. Define the components of a teratoma.

26. Describe techniques used for the antenatal detection of birth defects.

27. Understand how an amniocentesis is performed.

28. List information obtainable from an amniocentesis.

29. Discuss indications for doing an amniocentesis.

30. Describe the value of alpha-fetoprotein for detection of birth defects.

**Heart-Circulatory System (A-E) 75% Minimum Mastery Level Required**

1. Name the two complex systems which comprise the circulatory system and state the function of each system.

2. Identify from a description, a diagram, or radiograph, the organs and vessels of the circulatory system and explain the flow of fluid (blood and lymph) through the respective organs.

3. Define the following terms:
   a. myocardium
   b. endocardium
   c. epicardium
   d. systole
   e. diastole
   f. artery
   g. vein
   h. arterioles
   i. capillaries
4. Explain what is meant by the following:
   a. systemic circulation
   b. hepatic portal circulation
   c. pulmonary circulation

5. Name the two terminal collecting channels of lymphatic circulation and identify the areas of the body that spills into each.

6. Define the following terms which relate to angiography:
   a. percutaneous/closed injection
   b. antegrade
   c. retrograde
   d. seldinger technique
   e. arterial
   f. capillary
   g. venous
   h. lymphography
   i. lymphangiography
   j. lymphadenography
   k. thoracic duct
   l. right jugular, subclavian and bronchomediastinal trunks

7. Describe the primary indication(s) for:
   a. angiography
   b. lymphography

8. Explain the purpose of a 24 hour lymphogram follow up film series.

9. Give the types of contrast media which may be used in lymphography and describe the positive and negative aspects of using each type.

10. Describe the complications which may result from lymphography relative to injection of both dye and the contrast media.

11. Describe the contraindications for lymphography.

12. Compare an image of the lymph vessels with an image of the lymph nodes.

13. Define the following terms which are related to interventional radiologic techniques:
   a. percutaneous transluminal angioplasty
   b. transcatheter embolization
   c. inferior vena caval umbrella filter placement


15. Identify the major diseases which affect the cardiovascular system and can by diagnosed radiographically; match them to the appropriate disease category.

16. In regards to the cardiovascular system, define the terms which are emphasized or discussed. (lecture and/or syllabus)

17. Identify the MUGA (Multigated Acquisition Mode) scan as a nuclear medicine procedure which demonstrates the heart’s contraction capability.

18. Compare the definition of the terms vasa vasorum and coronary.

19. Given an AP or lateral radiograph of the chest, identify the various portions of the heart.

20. Relative to the cardiovascular system, compare the definitions of the terms stenosis and insufficiency.

21. Define the following terms:
   a. septal defect
   b. tetralogy of Fallot
   c. patent ductus arteriosus
   d. coarctation of aorta
   e. aneurysm

22. Explain the benefit of a barium swallow in diagnosing cardiac problems.

23. Identify the following as being variants of arteriosclerosis:
   a. atherosclerosis
   b. medical calcific sclerosis
   c. arteriolsclerosis

24. List the major risk factors for arteriosclerosis.

25. List the major sites where arteriosclerosis is apt to occur.

26. Describe symptoms associated with arteriosclerosis included by ischemia of the heart, brain, and legs.

27. List possible complications of arteriosclerosis.
28. Compare the definitions of the terms angina pectoris and myocardial infarction.
29. List possible complications of acute MI.

30. Know the American Heart Association’s definition of hypertension.
31. Define renal hypertension.
32. List the organs most damaged by hypertension.
33. Know the two pathophysiologic adjustments made by the heart prior to development of congestive heart failure.
34. Define the term congestive heart failure. (CHF).
35. List the factors usually responsible for CHF.
36. Describe the signs and symptoms of CHF.
37. Describe the pathogenesis of pulmonary edema.
38. Know how pulmonary edema is treated.
39. List several cardiac diseases having an infectious etiology.
40. Describe the pathogenesis of rheumatic heart disease.
41. Define the terms endocarditis, myocarditis, and epicarditis.
42. List complications of rheumatic heart disease.
43. Describe the major lesion caused by syphilis in the cardiovascular system.
44. Define the term thrombophlebitis.
45. List the three factors that can precipitate thrombophlebitis.
46. List three major complications of thrombophlebitis.
47. Describe how venous valvular incompetence can occur.
48. List complications that may accompany varicose veins.
49. List the three organs where arterial thrombosis and infarction cause deaths.
50. Describe the signs and symptoms of pulmonary embolism.
51. Compare the definition of the term aneurysm to the definition of the term dissecting aneurysm.
52. Describe measures that can be taken to prevent pulmonary embolism.
53. Define the following terms:
   a. cyanotic congenital heart disease
   b. patent ductus arteriosus
   c. ventricular septal defect
   d. atrial septal defect
   e. persistence of the common truncus arteriosus
   f. transposition of great arteries
   g. sidus inversus

54. Identify the defects common to a cardiac abnormality termed Tetralogy of Fallot.
55. Identify the diseases of the lymphatic system which can be diagnosed by lymphography.

**Central Nervous System (A-E) 75% Minimum Mastery Level Required**
1. Identify from a description, diagram, or radiograph the organs and vessels of the central nervous system.
2. Name and discuss the location of the cranial and spinal cord meninges and explain their function.
3. Describe the origin and termination of the spinal cord.
4. Identify the space between the meninges into which a needle is inserted for a spinal puncture.
5. List the various radiologic or pararadiologic methods which may be used to examine the central nervous system. Identify those methods which for the most part have been replaced by CT or MRI.
6. Differentiate pneumoventriculography and pneumoencephalography on the basis of injection route, method of structural delineation, and clinical indications or contraindications. (historical significance only)
7. Define the following terms and explain the diagnostic purpose of the examinations:
   a. myelography
   b. diskography
   c. cerebral angiography
8. Identify the following as primary conditions which can be diagnosed using CT or MRI:
   a. contusion
   b. hematoma
   c. edema
   d. aneurysm
   e. tumor
9. Define the following terms:
   a. lethargy
b. stupor  
c. coma  
d. convulsion  
e. seizure  
f. faint  
g. epilepsy

10. Discuss the role of positron emission tomography in the diagnosis of Huntington’s disease, stroke, brain tumors, Alzheimer’s disease, spasmodic torticollis, and other movement disorders.

11. Describe the morphologic unit of the central nervous system (CNS).

12. Discuss the concept of localization of neurological function.

13. List the features unique to the CNS which make disease of the brain whether benign or malignant a life-threatening situation.

14. Define the terms atrophy, ischemia, chromatolysis, necrosis, and gliosis.

15. List symptoms for cerebrovascular accidents.

16. Describe the major life-threatening complication of cerebral edema.

17. Know the pathogenesis of hydrocephalus.

18. Define the terms agenesis, anencephaly, spina bifida, meningomyelocele, encephalocele, and microcephaly.

19. Define the terms paraplegia and syringomyelia.

20. List lesions that can result from trauma to the head.


22. Define the terms concussion and contusion, and also coup and contre-coup.

23. Describe the location of a lesion that results in quadriplegia.

24. Identify common sites of spinal cord injury.

25. List three types of infectious processes occurring in the CNS.

26. Describe the clinical pattern of multiple sclerosis and also describe the role of MRI in the early diagnosis of this disease.

27. List the arteries supplying the brain and describe the region of the brain each supply with blood.

28. Describe the cause of and clinical findings regarding transient ischemic attacks.

29. List the two major factors that determine the necrosis in the CNS.

30. Describe the pathogenesis of necrosis in the brain.

31. List the three causes of CVA.

32. Compare the clinical aspects of CVA according to etiology.

33. Describe where arteriosclerosis tends to occur.

34. Know the prognosis following cerebral infarction.

35. Know what condition predisposes an individual to intracerebral hemorrhage.

36. Describe the term aneurysm.

37. List the factors that determine prognoses for brain tumors.

38. Know how brain tumors are diagnosed.

39. Describe the radiographic assessment of brain tumors.

40. List the major histologic types of brain tumors.

41. Describe the location and prognosis for meningiomas.

42. Compare the frequency of and prognosis for brain tumors.

43. Know the prognosis for glioma or astrocytoma.

44. Describe how brain tumors are treated.

45. Describe two peripheral tumors of nerves.

46. State the term which identifies a cranial nerve tumor.

47. Describe the precautions a technologist should take in the radiographic examination of the head to avoid depression of a skull fracture.

48. In regards to the CNS, define the terms which are emphasized or discussed, (lecture and course syllabus).

49. Describe the precautions a technologist should take in the radiographic examination of the spinal column to avoid injury to the spinal cord.

Osseous System (A-E) – 75% Minimum Mastery Level Required

1. Define the following terms and give examples of each:
   a. long bones
   b. short bones
   c. flat bones
   d. irregular bones
2. Define the following terms:
   a. diaphysis
   b. metaphysis
   c. epiphyses

3. Recognize the following as being congenital abnormalities of the skeletal system and be able to define each disorder:
   a. clef palate
   b. spina bifida
   c. clubfoot
   d. dislocation of hip
   e. osteopoikilosis
   f. bipartite patella
   g. Madelung’s deformity
   h. osteogenesis imperfecta
   i. block vertebra
   j. dwarf (achondroplasia)

4. Define rheumatoid arthritis.
5. Describe the typical appearance of a person with rheumatoid arthritis.
6. Explain why ankylosing spondylitis occurs in families.
7. Predict the prognosis for a patient with rheumatoid arthritis.
8. List modes of treatment for rheumatoid arthritis.
10. Compare rheumatoid arthritis with osteoarthritis both clinically and pathologically.
11. Define the terms chondrocyte, osteophyte and ankylose.
12. Describe the physical deformities accompanying osteoarthritis.
13. Understand the intervertebral disc syndrome.
15. Define Charcot joint.
17. Describe the process of healing of bone.
18. List reasons why bones fail to heal.
19. Define osteomyelitis.
20. Define osteomalacia.
22. List the endocrine glands and the diseases linking endocrine and bone dysfunction.
23. Define the following terms:
   a. acromegaly
   b. osteogenesis imperfecta
   c. achondroplastic dwarfism
24. Define osteoporosis.
25. List factors causing osteoporosis.
27. List two complications of Paget’s disease.
29. Know the substance found in the joints of patients with gout.
30. Define pseudogout.
31. List benign and malignant bone tumors.
32. List signs and symptoms of bone tumors.
33. Describe osteoma.
34. Know the prognosis for osteogenic sarcoma.
35. Compare various cartilagenous tumors.
36. Describe the following fractures:
   a. simple
   b. compound
   c. torus
   d. pathologic
37. Describe the most common complications of fracture.
38. Define the term Legg-Perthes disease.
39. Identify the following as being benign tumors of bone:
   a. osteoma
   b. chondroma
   c. giant cell
   d. bone cyst
40. Identify the following as being malignant tumors of bone:
   a. osteogenic sarcoma
   b. Ewing’s tumor
   c. multiple myeloma
   d. metastatic-carcinomas from breast, lung, prostate and kidney
41. Relative to injury to the following areas, describe the special care and management that a patient should be given:
   a. skull, face or neck trauma
   b. wrist trauma
   c. shoulder, arm or forearm trauma
   d. hip or pelvis trauma
   e. femur trauma
42. Explain the importance of including both joints when a fracture is noted in the leg or forearm.
43. Explain the importance of including a joint on all extremity radiographs.
44. Describe the role of nuclear medicine in the diagnosis of bone disease.

**Mammography (Breast Disease) (A-E) - 75% Minimum Mastery Level Required**

1. Identify the factors which must be carefully selected in order to maximize infrastructural contrast and detail in a radiograph of the breast.
2. Explain why radiography of the breast is such a challenge and describe the breast which inherently affords better radiographic infrastructural contrast.
3. Explain why each mammogram has to be tailored to an individual patient and define/describe the following types of breast:
   a. adolescent
   b. pregnancy
   c. reproductive
   d. menopausal
   e. senescent
   f. anovulatory
   g. supplemental hormone therapy following artificial menopause
   h. parity
4. Explain why mammography routinely is done using:
   a. compression
   b. an ion-chamber unit
5. Explain why conventional radiography, especially using ordinary films and screens and a nondedicated x-ray unit, is inappropriate for mammography.
6. Explain the importance of maintaining consistent mammographic images of optimal detail and contrast.
7. Explain why it is important to be able to resolve structures as small as 0.1 mm in radiographs of the breast.
8. Explain the importance of avoiding repeats and using low-dose film-screen recording systems when radiographically examining the breast.
9. Give at least five (5) positive benefits of compressing the breast.
10. Describe the role of radiology in the localization of nonpalpable tumors of the breast prior to surgical removal of these
neoplasms.

11. Identify the possible localizing media which will permit the radiologist to localize the diseased site during radiographic examination and will also permit the surgeon to identify the mass during exploration of the breast at surgery.

12. Describe the role of radiology in the confirmation of the removal of a suspected lesion by surgery and the identification of the area in the gross specimen for microscopy by the pathologist.

13. Describe the critical requirements of specimen radiography in order to ensure the correct diagnosis and limit the time the patient is kept under anesthesia.

14. Describe the method of radiographic examination which may be used to investigate the milk ducts in the breast. Give particular attention to the following topics:
   a. type of contrast medium used
   b. equipment and supplies needed for the examination
   c. sterile technique
   d. radiographic procedure

15. Give the criteria for determining the use of a grid in mammography.

16. Explain how the use of macroradiography can aid in the differential diagnosis of benign or malignant disease of the breast.

17. Describe the differential diagnosis of benign versus malignant breast disease.

18. Recognize how benign and malignant tumors can cause ill-defined lumps in the breast.

19. Know how to do a monthly breast examination.

20. List the breast tumors most common during each decade of life.

21. Understand how cystic disease and hereditary factors increase chances for breast cancer.

22. Define the term dysplasia including fibrosis, cystic disease and adenosis in your definition.

23. List the common signs and symptoms of breast cancer.

24. Know the frequency of occurrence of breast cancer in women and men.

25. Recognize the importance of biopsy and frozen section diagnosis in cases of breast cancer.


27. List the six factors determining the prognosis for women with breast cancer.


Required Assessments:

Assessment Names and Descriptions:
An examination directly related to the instructional objectives will follow completion of:

   a. Introduction
   b. Respiratory System
   c. Gastrointestinal System
   d. Urinary System
   e. Male Reproductive System
   f. Female Reproductive System
   g. Circulatory System
   h. Central Nervous System
   i. Osseous System
   j. Mammography – Breast Disease

Mastery level for each unit exam must be 75% or greater. Assessment of 3 pathology case studies as per attached defined criteria.

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<tr>
<th>Course</th>
<th>CSLO 1</th>
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<tr>
<td>RT 2540</td>
<td>Tests 1-10 Path case oral presentation Final exam</td>
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Grading Scale or Policy, Weekly Outline, Topics, or Instructional Activities:
1. 80% of the mean average of the topical unit examinations (Minimum mastery level for each unit exam is 75%)
2. 20% attributable to oral presentation and class participation

There will be two (2) points deducted from the final grade for each absence exceeding the formula:
Excused days absence = 1/15 (class hours, number of weeks) per semester
Because promptness is as important as attendance, a combined frequency of tardiness of 50 minutes will equal one day’s absence.
100% attendance will be rewarded with 5 points added to the final grade.

Chattanooga State Community College
Radiologic Technology Program
Statement of Understanding

Disabilities Statement
Students who have educational, psychological, and/or physical disabilities may be eligible for accommodations that provide equal access to educational programs and activities at Chattanooga State. These students should notify the instructor immediately, and ideally should contact Disabilities Support Services (S-113, phone 697-4452) within the first two weeks of the semester in order to discuss individual needs. The student must provide documentation of the disability so that reasonable accommodations can be requested in a timely manner. All students are expected to fulfill essential course requirements in order to receive a passing grade in a class, with or without reasonable accommodations.

Disruption Statement
Disruption or obstruction of teaching, research, administration, disciplinary proceedings, other college activities, including its public service functions on or off campus, or other authorized non-College activities, when the act occurs on College premises, is subject to disciplinary sanctions.

The terms classroom disruptions means behavior a reasonable person would view as substantially or repeatedly interfering with the conduct of a class. A student who persists in disrupting a class will be directed by the faculty member to leave the classroom for the remainder of the class period. The student will be told the reason(s) for such action and given an opportunity to discuss the matter with the faculty member as soon as possible. Prompt consultation will be undertaken by the faculty with the Department Dean and the College Judicial Officer.

If a disruption is serious, and other reasonable measures have failed, the class may be adjourned and the campus police summoned.

Pagers and Cell Phones – Activated pagers and cell phones are strictly prohibited when class is in session.

The RADIOLOGY TECHNOLOGY PROGRAM is a competency-based program. The goal of each instructor is to have students complete the competency requirements of each course. Completion of set competency areas of a course is greatly affected by student’s ability to progress through the material. If competencies are not mastered in a specific course, a subsequent course will be structured to assure competency attainment of those areas.

Each topic in each syllabus will indicate a mastery level for the objectives that correlate to the topic. Evaluation is criterion-referenced to the objectives for each topic. Mastery level criteria for each topic must be met. Remediation is permitted with restrictions. The first remediation test grade will be averaged with the original test grade. A second remediation will result in ten points being subtracted from the specific topic grade. Subject to the discretion of the instructor, further remediation and testing may result in a reduction of one letter grade for the course for each occurrence, which may lead to failure of the course.

A grade of “C” or better in the following courses is required for progression:
1. All RT prefixed courses
2. Human Anatomy & Physiology I, II (BIOL 2010, BIOL 2020)
3. Radiobiology and Radiation Protection (RT 2543)
4. Math 1710 if required
I hereby acknowledge that I have read the syllabus and understand the policies regarding objectives, grading, performance, participation, absenteeism, tardiness, and conduct.

I understand the policy on NO activated cell phones or pagers during class time and agree to keep these devices enclosed in a container (such as a purse or backpack) so that they are not visible to anyone in the classroom.

Chattanooga State is committed to promoting a mode of individual conduct based on the principles of honesty, fairness, trust, respect and responsibility. I understand that academic integrity is demanded in ALL records, exercises, assignments and tests in the classes. Those who falsify records, copy other work or share such information inappropriately will receive an F in the course.

I understand that most courses in this program offer supplemental websites which are required on a routine basis. Computers with web access are readily available on campus and may be used to access this required component of the course.

My signature documents my agreement to abide by all policies and conditions stated in the course syllabus, as well as all program policies.

____________________________________       __________________________
Name in print                                                              Date

____________________________________
Signature