

Course Syllabus

RT 2430 – Radiographic Positioning-Film Critique III

Class Hours: 3

Credit Hours: 3

Laboratory Hours: 0

CATALOG COURSE DESCRIPTION: This course is the third of a three course sequence in the fundamentals of radiographic position and procedures. The complete sequence provides the opportunity for the student to develop the knowledge and skills necessary to perform the routine radiographic examinations of the skeletal system, soft tissue structures, and common contrast procedures such as GI, IVP, BE, and cholegraphy. Topics covered in this course include radiography of the soft-tissue structures of the neck, thorax, and abdomen. In addition, the characteristics of contrast media relative to their proper use in the body, side effects, and methods of administration and opacification are discussed. Normal radiographs of each system of the body are reviewed and emphasis is placed on preprocedure prep, patient care and management, contraindications for and complications of the procedures, and proper positioning and exposure of the structures.

ENTRY LEVEL STANDARDS: A grade of "C" or better in all completed RT prefixed courses, x-ray physics, and Human anatomy and physiology is required for progression to this course. Having had this learning experience, the student should demonstrate knowledge of the structure and function of the human body, medical terminology, radiographic exposure, radiographic positioning and positioning terminology, and patient care and management. In addition, the student should demonstrate a responsible attitude toward attendance, independent learning activities, class, laboratory and clinical participation, and course preparation.

PREREQUISITES AND/OR COREQUISITES: Student must have completed all courses taught in the first year of the Radiologic Technology program.

TEXTBOOK AND OTHER REFERENCE MATERIAL BASIC TO COURSE:

Ballinger, Merrill's- Atlas of Radiographic Positions and Radiologic Procedures, Radiographic Positions and Routine Radiographic Procedures-Learning Module I.

Workbook/lab manual, Radiographic Positions and Related Anatomy, Vol. 2

Bontrager and Basic Medical Techniques and Patient Care in Imaging Technology, Torres, 6th Edition

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#1. Provide basic patient care and comfort, well-being, safety, procedural materials appropriate to quality are and exam performance using proper sterile or aseptic technique to prevent contamination of patients, self, sterile trays, instruments or fields.

CSLO #3 Demonstrate an understanding of the patient preparation required prior to performing each radiographic examination. (diet, medication, etc.) (I)

CSLO #4 Demonstrate an understanding of the need for contrast media; the characteristics of contrast media; their administration, use, and delivery to particular organs; and the contraindications for and complications of their use. (V, VI, and VII)

CSLO #11 Given a specific pathologic condition, describe the radiographic examination which is best for demonstrating the pathology and state the special precautions to be taken in the treatment of the patient. (VIII)

CSLO #12 Be able to demonstrate the correct technique for administration of enemas and understand his/her limitations and responsibilities during radiographic examinations that require rectal administration of contrast media. (V, VIII, IX)

CSLO #13 Discuss the appropriate care for patients who have gastric tubes, chest tubes, tracheostomy tubes, or other special conditions. (V, VIII, IX)

CSLO #14 Be able to assist with the insertion of a catheter into the urinary bladder and care for those patients with a Foley catheter in place. (V, VIII, IX, X)

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 #1 Demonstrate knowledge of positioning and anatomic terminology. (I)

CSLO #2 Demonstrate knowledge of the anatomy and function of the organs of the neck, respiratory system, digestive system, urinary system, male/female reproductive system, and breast. (I)

CSLO #5 Properly associate a type of body architecture with the positioning and exposure adjustments necessary to radiographically demonstrate a particular organ. (I, II, IV, and VII)

CSLO #6 Given diagrams, anatomic structures, or radiographs, identify and/or locate component parts. (I)

CSLO #7 Locate anatomy from the standpoint of the topography of anatomy and explain the relationship of organs to each other. (I)

CSLO #8 Given simulated situations which apply to the following topics, identify or describe accepted professional practice: (IV, V, VI, and VII)

1. Evaluation of radiographic orders
2. Room preparation
3. Patient Care and Management

CSLO #9 Following the criteria below, demonstrate knowledge of and perform radiographic examinations of the neck, upper and lower respiratory tract, organs of the digestive system, organs of the urinary system, organs of the male/female reproductive system and the breast. (I, II, IV, VIII)

1. Part
 - a. Position
 - b. Structure(s), visualized and functions demonstrated
 - c. Pathology demonstrated
 - d. Caliper use
2. Film size/placement/identification and R & L markers
3. Technique formulation/selection
 - a. mA
 - b. Time
 - c. kVp
 - d. FFD
4. Beam alignment/angulation
5. Radiation Protection
 - a. Exposure factors
 - b. Beam alignment/angulation
 - c. Beam limitation/shielding
6. Patient Instructions
 - a. Respiration
 - b. Stress maneuvers
 - c. Diet, medications, postprocedure follow-up
 - d. Instructions

CSLO #10 Critique radiographs to determine proper positioning, collimation, identification, R and L markers, image quality, evidence of radiation protection, and structures shown for basic projections of the neck; the organs of respiration, digestion, urinary, male/female reproduction systems; and the breast. (III and VIII)

Other Learning Indicators or Objectives (optional): THE STUDENT WILL BE ABLE TO:

ANATOMY AND RADIOGRAPHY OF THE SOFT TISSUE STRUCTURES OF THE NECK (A-K) (75% MINIMUM MASTERY LEVEL REQUIRED)

1. Accurately describe the region of the neck relative to upper and lower boundaries.
2. Given a diagram, radiograph, anatomic model or description, identify the structures located in the anterior part of the neck and be able to describe their function.

3. Relative to external palpable landmarks locate the following:
 - a. pharynx
 - b. nasopharynx
 - c. oropharynx
 - d. laryngeal pharynx (hypopharynx)
 - e. Larynx
4. Given a diagram, radiograph, anatomic model or description of the following portions of the larynx, identify/locate them.
 - a. Laryngeal Vestibule
 - b. False Vocal Cords
 - c. True Vocal Cords
 - d. Laryngeal Ventricle
 - e. Pyriform Sinuses
5. Locate the pharyngeal tonsil and the palatine tonsils.
6. In examination of the nasopharynx, describe the problem encountered when the patient phonates; when the patient is not breathing through his nose.
7. Define the following terms and describe the special precautions (if any) and procedural considerations which must be taken with patients who have this illness.
 - a. Croup
 - b. Epiglottitis
 - c. Neoplasm (benign or malignant)
 - d. Foreign Body (opaque or nonopaque)
 - e. Retropharyngeal Abscess
 - f. Diverticulum
 - g. Tracheoesophageal Fistula
 - h. Hypertrophy or Pharyngeal or Palatine Tonsils
 - i. Laryngeal Laceration (Trauma)
8. Identify contrast media commonly used for radiography of anterior soft-tissue structures of the neck.
9. Describe radiographic methods often employed for examination of the following:
 - a. Palatography
 - 1) Tumors of soft palate
 - 2) Abnormalities of chewing and swallowing
 - 3) Cleft Palate
 - b. Nasopharyngography
 - 1) Hypertrophy of pharyngeal tonsil
 - 2) Nasopharyngeal Tumors
 - c. Pharyngography
 - d. Laryngopharyngography
 - 1) Plain films (negative contrast)
 - a) Soft Tissue technique
 - b) High kV-Heavy filtration technique
10. Describe the response of the various structures of the larynx attained with the following respiratory or stress maneuvers.
 - a. Quiet Inspiration
 - b. Normal (Expiratory Phonation)
 - c. Inspiratory Phonation
 - d. True Valsalva Maneuver
 - e. Modified Valsalva Maneuver
11. Relative to the following points, describe the procedure to be used in tomography of the larynx.
 - a. Patient position
 - b. Central Ray placement and part alignment to film
 - c. Setting Tomographic level
 - d. Structures shown and functions demonstrated

12. Describe the limitations of radiography relative to examination of the thyroid gland and explain how enlargement or calcification of this gland may be shown radiographically.
13. Identify the paradiagnostic procedures which may be used to better demonstrate the thyroid gland.
14. Differentiate between a nasogastric and nasoenteric tube.
15. Identify a Levin tube, Sump tube, and Cantor tube.
16. List the steps necessary to remove a gastric tube.
17. Describe patient care for the patient who has a gastrostomy tube.
18. Explain considerations for a patient who is receiving parenteral nutrition or has a central venous catheter.
19. List the symptoms for a patient who needs emergency suctioning and explain appropriate patient care for this condition.
20. Explain considerations for a patient with a tracheostomy.
21. Explain considerations for a patient on a mechanical ventilator.
22. Describe patient care considerations for the patient with a chest tube and water-sealed drainage.
23. Explain considerations for a patient with a tissue drain.

BODY CAVITIES, SURFACE MARKING AND BODY HABITUS (E-G) (75% MINIMUM MASTERLY LEVEL REQUIRED)

1. Name the two great cavities of the body and identify the major component portions of each cavity.
2. Identify the principal structures located in the following cavities:
 - a. Thoracic cavity
 - b. Abdominal cavity
 - c. Pelvic cavity
3. Name/identify the four imaginary planes known as Addison's planes and the nine regions formed by them.
4. Name the four types of body architecture classified by Mills and discuss the body form relative to size, shape, position, and tonus of internal organs.

ANATOMY AND POSITIONING OF THE THORACIC VISCERA (A-K) 75% MINIMUM MASTERLY LEVEL REQUIRED)

1. Relative to upper and lower boundaries accurately describe the thoracic cavity.
2. Identify the major thoracic viscera.
3. When given a drawing, anatomic section, or radiograph of the chest, label or locate the following structures:
 - a. Right lung
 - 1) Upper Lobe
 - 2) Middle lobe
 - 3) Lower Lobe
 - b. Left Lung
 - 1) Upper lobe
 - 2) Lower Lobe
 - c. Heart
 - d. Trachea
 - e. Hilum
 - 1) Left Main Bronchus
 - 2) Right Main Bronchus
 - f. Base
 - g. Apex
 - h. Diaphragm
 - i. Mediastinum
 - 1) Superior Mediastinum
 - 2) Anterior Mediastinum
 - 3) Middle Mediastium
 - 4) Posterior Mediastinum
4. Explain why a foreign body entering the trachea is more likely to pass into the right bronchus than into the left.
5. In reference to the lungs, define the following:
 - a. Atria
 - b. Infundibula

c. Alveoli

6. Identify the radiographically important structures contained in the mediastinum.
7. Properly describe the esophagus from the standpoint of the two organs it connects, its beginning and end relative to bony landmarks, and its position in the thoracic cavity.
8. Relative to the esophagus, identify the two areas of narrowing and two sites of indentation.
9. Describe the position of the thymus gland and its radiographic significance.
10. Describe the appearance of an acceptable PA and lateral chest radiograph.
11. Explain the reason for positioning the arms to rotate the scapulae laterally in an AP/PA projection of the chest.
12. State the reason for performing chest radiography erect, 72 inches. (FFD)
13. Explain why exposures should be made on the second full inspiration.
14. Describe which lateral projection should be routinely taken of the chest.
15. state the reasons for examination of the chest 1)at the end of both inhalation and exhalation 2) by double exposing at the end of inhalation and exhalation.
16. State the level at which the CR must be centered 1) for the lungs; 2) for the heart or aorta.
17. Describe the method of image evaluation which identifies rotation of the chest in the 1) PA/AP projection; 2) in the lateral projection.
18. Explain the reason for asking a woman with large, pendulous breasts to pull them upward and laterally before an exposure of the chest in the AP/PA projection is made.
19. Explain the significance of a correctly penetrated heart when doing chest radiography.
20. Compare the image of the following:
 - a. Erect chest with a recumbent chest
 - b. 72 inch chest with a 36 inch chest
 - c. Non-bucky pathologic chest with a bucky pathologic chest
 - d. PA chest with an AP chest
21. Be able to discuss or answer questions concerning the following positioning considerations: (all positions of the lungs, trachea and bronchi)
 - a. Part position (examples AP,PA, lateral, obliques lordotic)
 - b. Structure(s) visualized and functions demonstrated
 - c. Pathology demonstrated
 - d. Film/screen combination used
 - e. Film size/placement/identification/markers
 - f. Beam alignment/angulation
 - g. Beam limitation/shielding
 - h. Patient instructions
 - 1) Respiration
 - 2) Other
22. Explain the importance of exposure during inspiration for examinations of the trachea.
23. In the examination of the trachea and superior mediastinum, explain the reason for rotating the shoulders posteriorly.
24. Give the reasons for doing a lateral projection of the trachea and superior mediastinum.
25. Explain the main aim of the transshoulder lateral projection (Twining Method).
26. Identify the left PA oblique projection as the reverse duplicate of the AP oblique projection; likewise, identify the right PA oblique projection as corresponding to the left AP oblique projection by listing the structures shown in each projection.
27. State the main problem in evaluating the pulmonary apices in the routine PA/AP projection of the chest.
28. Describe the position of the clavicles relative to the apices of the lungs using the following projections:
 - a. PA axial (CR10 to 15 degrees cephalad-on inhalation)
 - b. PA (on exhalation)
 - c. AP axial (on full inhalation-15 to 20 degrees cephalad)
 - d. AP or PA lordotic
29. Describe the body position known as extreme lordosis.

30. Explain why on inhalation a PA axial projection on the pulmonary apices requires a central ray angulation through the third thoracic vertebra at an angle of 10 or 15 degrees cephalad; Where as, when exposure is made on exhalation, a perpendicular central ray angulation to the third thoracic vertebra is required.
31. Explain how placing the body in extreme lordosis can aid in the radiographic demonstration of the apices of the lungs.
32. State two pathologic conditions which may be demonstrated using the lordotic projection.
33. Describe the position of the body and the direction of the CR for the following projections:
 - a. Lateral Decubitus
 - b. Ventral Decubitus
 - c. Dorsal Decubitus
34. State the view(s) obtained when the following projections are done:
 - a. Lateral Decubitus
 - b. Ventral Decubitus
 - c. Dorsal Decubitus
35. Explain how fluid level or air will determine which lateral decubitus projection will be performed.
36. Explain how the lateral decubitus projections may be used to identify aspiration of the nonopaque foreign body.
37. Describe the methods of radiation protection which must be used when radiographing the chest.
38. Define the term bronchography and explain why it is employed.
39. Define the following terms:
 - a. Hemoptysis
 - b. Bronchiectasis
 - c. Chronic Pneumonia
 - d. Bronchial Obstruction
 - e. Pulmonary Tumor
 - f. Pulmonary Cysts
 - g. Pulmonary Cavities
 - h. Bronchopleural-cutaneous fistulae
40. Describe/explain the preparation and care of the patient who has a bronchogram.
41. Describe the preparation of the examining room for a bronchographic examination.
42. Describe the following methods of instilling contrast media in the bronchus.
 - a. Supraglottic
 - b. Intraglottic
 - c. Intatracheal Intubation
 - d. Percutaneous Cricothyroid or Percutaneous Transtracheal
43. Describe the routine bronchographic filming sequence which is used for:
 - a. Unilateral Opacification
 - b. Bilateral Opacification
44. Identify contraindications, indications for and complications of bronchography.
45. Define the following terms:
 - a. Bronchiectasis
 - b. Bronchitis
 - c. Bronchopneumonia
 - d. Histoplasmosis
 - e. Influenza
 - f. Legionnaire's Disease
 - g. Pneumonia
 - h. Tuberculosis
 - i. Asthma
 - j. Pneumoconiosis
 - k. Bronchostenosis
 - l. COPD
 - m. Emphysema
 - n. Empyema
 - o. Atelectasis

- p. Hydro(hemo)pneumothorax
- q. Pulmonary Edema
- r. Pneumocentesis
- s. Tracheostomy
- t. Tracheotomy
- u. pnea (ap-ne'-ah)
- v. Asphyxia (as-fik' se-ah)
- w. Dyspnea (disp-ne' – ah)
- x. Eupnea (up-ne'-ah)
- y. Hyperpnea (hi''perp-ne'-ah)
- z. Orthopnea (or''thop-ne'-ah)

GENERAL CHARACTERISTICS OF CONTRAST MEDIA (D) (75% MINIMUM MASTERY LEVEL REQUIRED)

1. Explain the usefulness of x-ray in the diagnosis of disease.
2. Explain the usefulness of contrast media in radiology and elaborate on the significance of their discovery.
3. Give examples of organs which cannot be seen radiographically without the use of contrast media.
4. Give the radiographic significance of the discoveries of each of the following investigators:
 - a. Walter Bradford Cannon
 - b. Dr. Everts Graham
 - c. Dr. Warren Cole
5. Define the following and give examples of each.
 - a. Endogenous Material
 - b. Exogenous Material
 - c. Radiolucent Material
 - d. Radiopaque Material
 - e. Positive Contrast Medium
 - f. Negative Contrast Medium
 - g. Semiopaque Material
6. Identify two main categories of exogenous agents.
7. State the four physical classes of positive (radiopaque) contrast media and give examples of each.
8. Describe an organ as shown on a radiograph if negative (radiolucent) contrast medium has been used; if positive (radiopaque) contrast medium has been used.
9. Explain the Radiologic significance of using radiolucent and radiopaque contrast media simultaneously.
10. Identify the radiopaque element most extensively used today and explain why it is so extensively used.
11. Describe the basic structure of most injectible contrast agents in use today. Give the radiographic significance of the iodine. Give the radiographic significance of the other atoms which make up the molecule.
12. Relative to their use in the body, give at least three characteristics besides radiopacity which makes radiopaque contrast useful in diagnosis.
13. Explain what aspect of the make-up of the contrast molecule determines excretion route.
14. Describe the usefulness of cholografin from the standpoint of side chain structure and protein binding and identify the organ which is most likely to pick it up from the blood.
15. Explain why iodized oils should not be injected into blood vessels.
16. Identify the "ideal" characteristics of contrast material relative to the following:
 - a. Iodine Content
 - b. Viscosity
 - c. Toxicity
17. Define the following:
 - a. Solute
 - b. Solvent
18. Explain the importance of knowing the electrolyte content (sodium) of the contrast medium.
19. Relative to the medical use of contrast media, explain the meaning of the following:
 - a. Selective Techniques

- b. Excretion-Controlled Techniques
20. Define the following:
- a. Viscosity
 - b. Water solubility
 - c. Opacification
 - d. Toxicity
 - e. Osmolality
 - f. Economy
21. Properly classify the two main categories of adverse reaction to contrast media and describe each reaction.
22. Explain the physiology associated with contrast medium reactions, and the probable cause for allergy patients to react as they do.
23. Identify the single most important item to have on hand during any contrast procedure.
24. Explain the use of the term dye when referring to contrast agents.
25. Define the following terms:
- a. Cardiovascular System
 - 1) Angiography
 - 2) Angiocardiography
 - 3) Arteriography
 - 4) Selective Coronary Arteriography
 - 5) Selective Renal Arteriography
 - 6) Peripheral Arteriography
 - 7) Aortography
 - 8) Venocavography
 - 9) Venography
 - 10) Splenoportography
 - 11) Cerebral Angiography
 - b. Biliary System
 - 1) Cholangiography
 - 2) Operative Cholangiography
 - 3) Percutaneous Transhepatic Cholangiography
 - 4) T-Tube or Postoperative Cholangiography
 - 5) Cholecystography, intravenous
 - 6) Oral Cholangiography
 - 7) Oral Cholecystography
 - c. Urinary System
 - 1) Excretion Urography (intravenous Pyelography-IVP)
 - 2) Drip Infusion pyelography
 - 3) Cystography
 - 4) Retrograde Pyelography
 - 5) Retrograde Cystourethrography
 - 6) Voiding Cystourethrography
 - d. Gastrointestinal System
 - 1) Gastroenterography
 - e. Reproductive System
 - 1) Hysterosalpingography
 - 2) Vesiculography
 - 3) Epididymography
 - 4) Epididymovesiculography
 - f. Respiratory System
 - 1) Bronchography
 - g. Nervous System
 - 1) Myelography
 - h. Miscellaneous

- 1) Arthrography
- 2) Sinography
- 3) Lymphography
- 4) Sialography
- 5) Discography

ANATOMY OF THE DIGESTIVE SYSTEM (A, B, E, F, G and J) (75% Minimum Mastery Level Required)

1. Describe the main structures of the digestive system relative to primary and accessory organs.
2. Describe the alimentary tract, and identify the primary and accessory organs and state their function.
3. Describe the main function of the digestive system and explain its five basic activities which include the following:
 - a. Ingestion
 - b. Peristalsis
 - c. Digestion
 - d. Absorption
 - e. Egestion (defecation)
4. Define the following:
 - a. Mastication
 - b. Deglutition
5. Describe the peritoneum relative to its overall structure and function and its various layers.
6. Given a diagram, radiograph, anatomic model or description of the following organs of the digestive system, identify/locate their various components.
 - a. Stomach
 - b. Small Intestine
 - c. Large Intestine (Colon)
 - d. Liver, Gallbladder, and Biliary System
 - e. Pancreas
7. Describe peristaltic activity in the following organs and explain the need for concern about limiting the exposure time.
 - a. Esophagus
 - b. Stomach
 - c. Small Intestine
 - d. Colon
8. Identify the organs involved in:
 - a. Carbohydrate Digestion
 - b. Protein Digestion
 - c. Fat Digestion
9. Explain the role of the small intestine and colon in water absorption.
10. The liver has many physiologic functions, describe the function which is of primary interest from the Radiologic standpoint.
11. Describe the role of the pancreas in both the digestive and endocrine process.
12. Define the following:
 - a. Secretion
 - b. Excretion
 - c. Endocrine
 - d. Exocrine
13. Define the following terms:
 - a. Ascariasis (as''kah-ri''ah-sis)
 - b. Colitis
 - c. Diverticulitis
 - d. Enteritis (en''ter-l''tis)
 - e. Enterocolitis (en''ter-o-ko-li''tis)

- f. Hepatitis
- g. Pancreatitis
- h. Atresia (ah-tre'-ze'ah)
- i. Congenital Hypertrophic Pyloric Stenosis
- j. Hirschspring's (hirsh'sproonz) disease
- k. Calculus
- l. Cholelithiasis (ko''le-li-thi'-ah-sis)
- m. Diverticulosis
- n. Hernia
- o. Hiatal Hernia (hi-a'tal)
- p. Intussusception (in''tus-sus-sep'-shun)
- q. Achalasia (ak'ah-la'ze'ah)
- r. Ascites (ah-si'tez)
- s. Jaundice (jawn'dis)
- t. Stenosis
- u. Ulcer
- v. Dyspepsia (dis-pep'se-ah)
- w. Dysphagia (dis-fa'je-ah)
- x. Emesis
- y. Incontinence
- z. Nausea (naw'se-ah)
- aa. Volvulus (vol-vu-lus)
- bb. Flatus
- cc. Regurgitation
- dd. Peritonitis

RADIOGRAPHY OF THE DIGESTIVE SYSTEM (A – K) (75% Minimum Mastery Level Required)

1. When symptoms are obscure or the cause of the digestive disturbance has not been localized, explain the Radiologic examinations the patient may receive and describe an appropriate sequence of examination.
2. Correctly identify the type of patient who would receive routine intestinal tract preliminary preparation.
3. Given a particular abdominal preparation, explain the reason for the prep.; or given a particular examination, describe the appropriate prep.
4. Give the criterion for judging the quality of a noncontrast abdomen.
5. Compare the technique for a noncontrast abdomen with that for a contrast abdomen.
6. Define the term, presumptive diagnosis.
7. Describe the patient to whom preliminary abdominal preparation is never administered.
8. Describe the criterion for judging:
 - a. That voluntary motion has occurred.
 - b. That involuntary motion has occurred.
9. Explain why time of exposure is critical for examinations of the abdominal organs.
10. Be able to discuss or answer questions concerning the following position considerations: (Basic projections of the abdomen)
 - a. part position (examples-AP, KUB, lateral, oblique, upright, decubitus)
 - b. Structure(s) visualized and functions demonstrated
 - c. Pathology demonstrated
 - d. Film/screen combination
 - e. Film size/placement/identification/markers
 - f. Beam alignment/angulation
 - g. Beam limitation/shielding
 - h. Patient instructions
 1. respiration
 2. other
11. When given a diagram, anatomic torso or radiograph of the abdomen, identify the following structures:

- a. iliac crest
 - b. anterior superior iliac spine
 - c. greater trochanter
 - d. symphysis pubis
 - e. liver
 - f. pancreas
 - g. kidneys
 - h. spleen
 - i. gallbladder
 - j. small intestine (bowel)
 - k. large intestine (colon)
 - l. stomach
 - m. right and left major psoas muscle
 - n. diaphragm
12. State the anatomical relationship between the greater trochanter and the symphysis pubis; the crest of the ilium and the lumbar vertebrae.
 13. Describe the location of the following relative to 1) external palpable bony landmarks; 2) the four quadrants of the abdomen, and 3) the nine regions of the abdomen:
 - a. liver
 - b. gallbladder
 - c. kidneys
 - d. spleen
 - e. stomach
 - f. ureter
 - g. bladder
 - h. small intestine
 - i. colon
 14. Describe basic patient preparation for the abdomen.
 15. Define the following terms:
 - a. KUB
 - b. Peristalsis
 - c. Acute abdomen
 - d. Decubitus projection
 16. Explain how size, shape, position, tonus, and motility of the internal organs of the abdomen are determined by body form or habitus.
 17. Explain how abdominal organs will change position with phase of respiration or change of position of the body.
 18. State which projection should be performed when the patient is unable to sit up or stand for an upright abdomen.
 19. State why the patient should remain upright or lying on his/her left side for 10 minutes or more before an upright or left lateral decubitus is performed.
 20. Explain the need to include the diaphragm on an upright examination of the abdomen.
 21. Explain why the left lateral decubitus projection is done of the abdomen when the possibility of intraperitoneal gas is being investigated.
 22. State the routine projections taken when an acute abdomen series is ordered, and explain the filming sequence.
 23. State the radiographic significance of a PA, erect chest to include the diaphragm when investigating the possibility of intraperitoneal gas.
 24. Define the following terms:
 - a. abdominal fistulae or sinuses
 - b. colonic fistulae
 - c. small bowel fistula
 25. Compare the procedure to detect the origin of an abdominal fistulae with the procedure to detect the origin of a colonic or small bowel fistulae.
 26. Define the following terms:

- a. abdominal pneumoradiography
 - b. pneumoperitonography
 - c. retroperitonography
27. Identify the injection sites for the examination of the following cavities using radiolucent contrast and explain why the site is necessary.
- a. peritoneum
 - b. retroperitoneum
28. Describe the preprocedure prep for patients who are scheduled for pneumoradiography.
29. Relative to pneumoradiography, describe the structures shown by each of the following projections and explain:
- a. dorsal decubitus
 - b. ventral (prone) decubitus
 - c. PA
 - d. Right lateral decubitus
 - e. Left lateral decubitus
 - f. Erect
30. Describe the exposure adjustment necessary any time a radiolucent contrast medium is used.
31. Describe how diagnosis is made by pneumoradiography.
32. Identify the examinations which will demonstrate the following:
- a. surfaces of the liver and spleen and any cysts or tumor masses
 - b. free gas pocket in cases of subdiaphragmatic (subphrenic) abscess
 - c. presence of such lesions as biliary calculi, neoplasms, stenosis; and indirectly, lesions of the head of the pancreas
 - d. liver function
 - e. patency and condition of biliary ducts
 - f. concentrating and emptying power of the gallbladder
33. Define the following terms:
- a. cholegraphy
 - b. cholecystangiography/cholecystocholangiography
 - c. cholecystography
 - d. cholangiography
 - e. choledochography
 - f. percutaneous transhepatic cholangiography
34. For the examinations listed in objective 33, identify the route of entry of the contrast medium and the portion of the biliary tract examined.
35. Explain when an oral administration of contrast medium to demonstrate the gallbladder and biliary ducts would be contraindicated.
36. Explain when an intravenous administration of contrast medium to demonstrate the gallbladder and biliary ducts would be contraindicated.
37. Identify the indications for intravenous administration of a contrast medium to demonstrate the biliary tract and/or gallbladder.
38. Identify the indications for direct injection of a contrast medium into the biliary ducts.
39. Explain why the success of cholecystography by the oral method depends on the interdigestive function of each of the following organs:
- a. intestine
 - b. liver
 - c. gallbladder
40. Explain the rationale for using each of the following biliary tract diet preparations:
- a. an evening meal that is rich in fatty content (simple fats)
 - b. an evening meal that is fat-free
 - c. a noon meal that is rich in simple fats and an evening meal that is fat-free
 - d. NPO until after the examination with the exception of small amounts of water until midnight.

41. Given a particular contrast medium, describe the method by which it opacifies the biliary tract.
42. Describe the affect of body habitus on the location of the gallbladder.
43. Explain the need to place an identifying mark on the skin when doing a gallbladder series.
44. Be able to discuss or answer questions concerning the following positioning considerations: (Basic projections of the digestive and urinary systems)
 - a. part position (examples : AP/PA, lateral, oblique)
 - b. structure(s) visualized and functions demonstrated
 - c. pathology demonstrated
 - d. film/screen combination
 - e. film size/placement/identification/markers
 - f. beam alignment/angulation
 - g. beam limitation/shielding
 - h. patient instructions
 - 1) respiration
 - 2) other
45. For patients of average build, describe the general location of the gallbladder.
46. To obtain an oblique view of the gallbladder, describe the appropriate oblique position which should be used; explain the need to vary the degree of obliquity based on body habitus.
47. Explain the purpose/benefit of an upright examination of the gallbladder.
48. Describe the circumstances or patient type that might require that a direct right lateral view of the gallbladder be done.
49. Give reasons for doing a right lateral decubitus projection of the gallbladder.
50. Explain the purpose of feeding a patient a fatty meal, and then, taking follow up films.
51. Describe the effects of respiration on exposures of the gallbladder.
52. Define the following terms:
 - a. chime
 - b. calculi
 - c. papilloma
 - d. post cibum
53. Identify the noninvasive method of gallbladder and biliary tract examination which gives no radiation exposure to the patient.
54. State the appropriate kV range for biliary tract radiography and explain.
55. Describe the appropriate preliminary preparation and diet for intravenous cholangiography.
56. Explain why patients are dehydrated by withholding fluids for at least twelve (12) hours prior to an intravenous cholangiogram.
57. In regards to intravenous cholangiography, compare contrast medium preparation for infusion with that for a single bolus.
58. Give the relative time, post injection, when one could expect optimal opacification of the gallbladder.
59. Name several advantages of infusion intravenous cholangiography.
60. Compare routine positioning for the gallbladder with that for the biliary duct system.
61. Identify paradiagnostic modalities which are less invasive and overall better for examining the pancreas.
62. Describe the two primary Radiologic techniques used for examination of the pancreas.
63. Identify the palpable bony landmark used for centering the pancreas.
64. Name the pathologic conditions of the pancreas which may be demonstrated with injection of contrast medium.
65. Describe the appearance of inflammation of the pancreas upon injection of a contrast medium.
66. Explain when simultaneous cholecystocholangiography and urography may be helpful.
67. Identify the contrast medium used and describe the patient preparation for simultaneous examination of the urinary and biliary system.
68. Differentiate between negative and positive agents.
69. List the potential adverse effects of negative and positive contrast agents.
70. List and explain the following types of enemas: saline, hypertonic, oil- retention, tap water, soap suds and

self-administered.

71. Explain the precautions that must be taken when administering a barium or cleansing enema before, during and after.
72. Describe appropriate patient care when assisting with upper and lower GI series.
73. Explain patient consideration for those with an ostomy having a barium enema.
74. Locate sigmoid colostomy, descending colostomy, transverse colostomy, ascending colostomy and ileostomy.
75. Explain the logic behind scheduling patients with multiple contrast exams.
76. Explain the technologists responsibility in patient education concerning barium studies.

RADIOGRAPHY OF THE ALIMENTARY TRACT (A-K) (75% minimum mastery level required)

1. State the purpose of radioscopy in the radiologic examination of the gastrointestinal tract.
2. Identify the two types of contrast medium routinely used for Radiologic examination of the GI tract.
3. In regards to the contrast medium (barium), elaborate on/discuss the following topics:
 - a. Make up
 - b. Suspension medium
 - c. Transit time through the GI tract
 - d. Culture medium for bacteria
 - e. Contraindications of its use
4. In regards to the contrast medium (oral/hypaque/gastrografin), elaborate on/discuss the following topics:
 - a. Make up
 - b. Solvent medium
 - c. Transit time through the GI tract
 - d. Expected radiographic quality when examining the following areas of the GI tract
 1. Esophagus
 2. Stomach
 3. Small bowel
 4. Colon
 - e. Indication for use
 - f. Contraindications for use
 - g. Complications of its use
5. Describe the room preparation which is necessary to prepare for GI examinations.
6. Explain the need to limit the exposure time when radiographing the following portions of the GI tract.
 - a. Esophagus
 - b. Stomach
 - c. Small bowel
7. State appropriate maximum exposure times for normal esophageal, stomach, small bowel or colonic radiographic examinations and correct for each of the following conditions.
 - a. Hypomotility
 - b. Hypermotility
8. Relative to preprocedure prep, describe the procedure for each of the following examinations:
 - a. Esophagus
 - b. Stomach
 - c. Small Bowel
 - d. Colon
9. Given the following conditions, identify an appropriate mixture or type of contrast medium which is suitable:
 - a. Strictures of the esophagus
 - b. Intraluminal lesions of the esophagus
 - c. Obstruction of the esophagus
 - d. Nonopaque foreign bodies
10. Describe the benefit of using double contrast of the esophagus and give the typical method of accomplishing double contrast today.
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. Describe the routine procedure for radiographic examination of the esophagus.
13. Give the rationale for esophageal contract examinations for investigation of cardiac problems.
14. Explain why a RAO position of the esophagus is done in preference to the LAO position.
15. Identify the primary bony landmarks for frontal projections of the esophagus and describe film placement.
16. Identify the placement of a film anterior to posterior and superior to inferior for the RAO position of the esophagus.
17. Define esophageal varices.
18. Identify at least three (3) techniques which may be used to demonstrate esophageal varices.
19. In general, describe the procedure for upper GI examination.
20. Explain the rationale of not permitting the patient to smoke or brush his/her teeth after midnight preceding an upper GI procedure.
21. Explain why a patient is instructed to drink fluids and take a stool softener following any examination involving the administration of barium sulfate.
22. Describe the radioscopy examination procedure for GI.
23. Give the rationale for only giving the patient a tiny amount of barium in the initial part of the radioscopy examination.
24. Give the rationale for double contrast of the duodenal bulb.
25. Describe techniques used to get the barium to pass into the duodenum.
26. Identify the body position which often will aid in the emptying of the stomach.
27. Explain the need for the technologist to view the radioscopy images prior to performing the radiographic procedure of the stomach.
28. Explain the need to proceed with the radiographic examination immediately following radioscopy of the stomach.
29. Explain the diagnostic significance of each of the following radiographic positions/projections of the stomach.
 - a. Erect PA
 - b. Erect left lateral
 - c. Recumbent PA
 - d. Recumbent PA, central ray angled toward the head from 20-25 degrees in infants and from 35-45 degrees in adults
 - e. One of more recumbent RAO positions
 - f. Recumbent right lateral
 - g. Recumbent AP position sometimes aided by slight rotation toward the left
 - h. Recumbent AP with the head of the table lowered 25-30 degrees
 - i. Recumbent AP with the head end of the table lowered 10-15 degrees and the patient turned slightly toward the right of the spine
30. Explain the importance of spot filming during the radioscopy procedure.
31. For all aspects of the GI tract, be able to discuss or answer questions concerning the following positioning or procedural considerations:
 - a. Preprocedure prep and postprocedure follow-up
 - b. Part position-(examples-AP, oblique, lateral or other)
 - c. Film/screen combination used
 - d. Film size/placement/identification/markers
 - e. Beam alignment/angulation
 - f. Beam limitation/shielding
 - g. Patient instructions
 - h. Structure(s) visualized and functions demonstrated
 - i. Pathology
32. In terms of the various aspects of the stomach demonstrated, compare supine and prone projections of the stomach.
33. Identify the position(s) of the stomach which will show the following structures:
 - a. Contrast filled pyloric canal and duodenal cap in patients of the stenotic body style.
 - b. Contrast filled pyloric canal and duodenal bulb in patients of the hyperstenic body style.

- c. Air filled pyloric canal and duodenal bulb.
34. Give the rationale for exerting pressure on the abdomen and implementing the Muller maneuver to demonstrate minimal hiatal hernias.
 35. Define the hypotonic duodenography and give the rationale for performing the procedure.
 36. Define the following terms:
 - a. Spasmolytic
 - b. Antispasmodic
 - c. Atonic
 - d. Anticholinergic
 - e. Paralysis
 - f. Motility
 37. Name three drugs which may be used to induce paralysis of smooth muscle, and describe any contraindications for use.
 38. Relative to hypotonic duodenography, describe three ways of instilling barium and air in the duodenum.
 39. Give the rationale for doing motility or delayed studies of the GI tract.
 40. Explain the need to include a time-interval marker on all motility or delayed studies of the GI tract.
 41. Give the gastric emptying time of nonfood-containing contrast meals.
 42. Explain the need to include the stomach until it is empty on motility studies of the GI tract.
 43. Explain what is meant by the head or tail of a barium meal.
 44. After ingestion of a barium meal give the expected time one would see:
 - a. Head of barium at the hepatic flexure
 - b. Tail of barium in the terminal portion of the ileum
 - c. Barium completely filling the colon
 45. Discuss the diagnostic value of radiographic examination of the large intestine after ingestion of a contrast meal.
 46. Give three methods which may be used to radiographically examine the small bowel.
 47. Explain the rationale for spot filming the ileocecal region.
 48. Give the rationale for a small bowel enema.
 49. In complete reflux filling of the small bowel, explain the use of the drugs glucagons and valium.
 50. Give the volume of a barium normally used for complete reflux filling of the small bowel.
 51. Relative to small bowel enemas, explain the need to empty the large intestine before filming of the small bowel is begun.
 52. Explain how radiology may aid in relieving a small bowel obstruction.
 53. Define the following terms:
 - a. Sim's position
 - b. Fowler's position
 - c. Patient
 - d. Adipose
 - e. Hemoptysis
 - f. Volvulus
 - g. Intussusception
 - h. Hiatal hernia
 - i. Rugae
 - j. Haustra
 - k. Diverticulum
 - l. Embolus
 - m. Neoplasm
 - n. Metastasis
 - o. Megacolon
 - p. Redundant colon
 - q. Flatus
 - r. Colitis
 - s. Calculus

- t. Perforation
- u. Polyp
- v. Atresia
- w. Stenosis
- x. Isotonic
- y. Jaundice
- z. Fissure

54. Define the following terms:

- a. Fistula
- b. Colostomy
- c. Appendicitis
- d. Cholecystitis
- e. Diverticulitis
- f. Enteritis
- g. Esophagitis
- h. Hepatitis
- i. Pancreatitis
- j. Peritonitis
- k. Cholelithiasis
- l. Gastroenterocolitis

55. Define the following terms:

- a. Celiac
- b. Cholecyst
- c. Chyme
- d. Dentition
- e. Gingiva
- f. Langerhan's islands
- g. Lingua
- h. Mesentery
- i. Omentum
- j. Peritoneum
- k. Diabetes mellitus
- l. Hyperglycemia
- m. Retrograde
- n. Hypoglycemia
- o. Decubital ulcer

56. Define the following suffixes:

- a. ___plasty
- b. ___stomy
- c. ___otomy
- d. ___ectomy
- e. ___rrhaphy
- f. ___pexy
- g. ___centesis

57. Define the following terms:

- a. Cholecystectomy
- b. Colostomy
- c. Glossoplasty
- d. Enterorrhaphy
- e. Enterotomy
- f. Colopexy
- g. Paracentesis

58. Name the two primary methods of examining the large intestine.

59. Relative to diagnostic significance, compare an examination of the colon using barium only to an examination of the colon using a combination of barium and air.
60. Give the advantages and disadvantages of using the following contrast media in large intestine examinations.
 - a. Barium sulfate
 - b. Air
 - c. Carbon dioxide
 - d. Ingestible water-soluble iodinated media
61. Discuss the intestinal preparation for a patient scheduled for a barium enema.
62. Relative to body position discuss the insertion of the retention tube for a barium enema.
63. Discuss the complications which can result from over distending the retention balloon of the enema tip.
64. Relative to the following topics, discuss appropriate patient instructions prior to the administration of a barium enema.
 - a. Retention of the enema
 - b. Contraction of the anal sphincter
 - c. Relaxation of the abdominal muscles
 - d. Deep oral breathing
 - e. Assurance of modesty and embarrassment of barium loss
65. Discuss the advantages and disadvantages of administering the barium enema cold as opposed to warm.
66. State the temperature that a barium enema should be administered as a warm enema; cold enema.
67. Explain the reason for stopping the enema for a short period of time after the rectal ampulla is filled.
68. Discuss the routine radioscopic procedure for the large intestine giving particular attention to spot films done of the various regions of the colon.
69. Identify the positions which will best demonstrate the following regions of the intestine.
 - a. Retrosigmoid
 - b. Splenic flexure
 - c. Hepatic flexure
 - d. Cecum
70. Discuss the routine views taken for barium enema examinations, and describe the entering of the film for each of the following body styles.
 - a. Normal
 - b. Hypersthenic
 - c. Asthenic
 - d. Wide capacious abdomen
71. Identify the position(s) or radiographic techniques which can be used to demonstrate the following structures:
 - a. Loops of bowel that are redundant or overlapping
 - b. Rectosigmoid and sigmoid areas of the colon
 - c. Hepatic flexure
 - d. Splenic flexure
 - e. Anterior and posterior surfaces of the lower portion of the colon and the sigmoid free from overlapping
72. Define pre-evacuation and postevacuation film.
73. Explain the purpose of adding air to barium for colon examinations and describe the diagnostic value of doing this.
74. Explain the reason for immediately adding the gaseous medium after the evacuation of the barium mixture.
75. Explain why gas or barium should only be administered under radioscopic control.
76. Given a particular position or projection of the colon contrasted with air and barium, identify the portion of the large intestine best demonstrated.
77. Explain why loop colostomy is performed.
78. Define the following terms:
 - a. Enterostomy
 - b. Colostomy
 - c. Cecostomy

- d. Ileostomy
- e. Jejunostomy

79. Explain the need to do contrast enema on enterostomy patients.

80. Describe barium administration via colostomies.

URINARY SYSTEM (A-K) (75% MINIMUM MASTERY LEVEL REQUIRED)

1. When given a description, diagram or anatomic model of the kidney, identify the gross anatomic features and be able to describe the function of each component.
2. State the primary function of the urinary system.
3. Identify other systems of the body that aid in waste elimination.
4. Describe the placement of the kidneys relative to the abdomen and adrenal glands.
5. Explain why the right kidney is usually slightly lower than the left kidney.
6. Define ptosis and describe the dangers associated with this condition.
7. Describe the location of the kidneys relative to the vertebral bodies.
8. Define the following terms:
 - a. Parenchyma
 - b. Stroma
 - c. Antegrade
 - d. Retrograde
9. Identify the physiological unit of the kidney.
10. Describe the function of the adrenal glands and explain their relationship to the urinary system.
11. Describe the function of the adrenal glands and explain their relationship to the urinary system.
12. Given the following examination terms, properly identify the diagnostic purpose of each exam and the specific structures demonstrated.
 - a. Urography
 - b. Excretory urography (IVP, IVU)
 - c. Retrograde urography
 - d. Percutaneous antegrade urography
 - e. Cystography
 - f. Cystoureterography
 - g. Cystourethrography
 - h. Retroperitoneal radiography
 - i. Renal arteriography
13. Be able to list or identify the normal chemical constituents of urine.
14. List/describe the physical characteristics of urine.
15. Be able to list or identify abnormal chemical constituents of urine.
16. Define medical terminology associated with the urinary system. Give particular attention to the following terms:
 - a. Albuminuria
 - b. Glycosuria
 - c. Hematuria
 - d. Pyuria
 - e. Ketosis
 - f. Casts
 - g. Calculi
 - h. Micturition
 - i. Incontinence
 - j. Retention
 - k. Suppression (anuria)
 - l. Ptosis
 - m. Gout
 - n. Glomerulonephritis
 - o. Pyelitis
 - p. Cystitis

- q. Hemodialysis
 - r. Dysuria
 - s. Oliguria
 - t. Polyuria
 - u. Uremia
17. Describe the preprocedure preparation usually prescribed for the following examinations:
 - a. Excretory urography
 - b. Retrograde urography
 18. Explain why fluids are withheld for a minimum of twelve (12) hours preceding an excretory urogram.
 19. Explain why a patient may be required to force water for several hours preceding a retrograde urogram.
 20. Describe the appearance of a correctly exposed abdominal film to visualize the urinary system. Specifically discuss the appropriate kVp and exposure time selection.
 21. Name the most important thing to have available in case of a reaction to contrast medium.
 22. Given a specific radiographic procedure of the urinary system, be able to correctly explain or identify the reason for doing the procedure. Specifically address the following procedures.
 - a. KUB
 - b. Five, ten and twenty minute post
 - c. Tomograms
 - d. Erect
 - e. Postvoiding (post micturition)
 - f. Ureteric compression
 - g. AP projection with head end of the table lowered 15 to 20 degrees
 - h. PA projection
 - i. IVP
 - j. Cystography
 - k. Voiding cystography
 - l. Metallic bead chain cystography
 - m. Hypertensive IVP
 - n. Retrograde urography
 - o. Infusion nephrotomography
 23. Explain the importance of implementing infection control concerning catheterization of a patient.
 24. Examine the differences in catheterization of male and female.
 25. List the steps of removing an indwelling catheter and explain patient care of patients with an indwelling catheter.
 26. Describe effective patient care before, during and following cystography.
 27. Explain patient education, preparation, procedure and ureteral stent aspects of retrograde pyelography.
 28. Be able to discuss or answer questions concerning the following positioning considerations: (urinary system)\
 - p. part positioning (examples AP/PA, lateral, oblique)
 - q. Film/screen combination
 - r. Film size/placement/identification/markers
 - s. Beam alignment/angulation
 - t. Beam limitation/shielding
 - u. Patients instructions (void, respiration, other)
 - v. Structure(s) visualized and functions demonstrated
 - w. Pathology demonstrated

MALE REPRODUCTIVE SYSTEM (A-K) (75% MINIMUM MASTERY LEVEL REQUIRED)

1. When given a diagram, radiograph, anatomic model and /or description of the male reproductive organs, be able to identify/locate and/or describe the function of the following:
 - a. gonads (testes)
 - b. epididymis
 - c. ductus deferens (vas deferens)
 - d. seminal vesicle

- e. ejaculatory duct
 - f. prostate gland
2. Be able to identify the following organs as an external or internal genital organ or part external and part internal organ:
 - a. testes
 - b. epididymus
 - c. ductus deferens
 - d. seminal vesicle
 - e. ejaculatory duct
 - f. prostate gland
 - g. urethra
 3. Explain the diagnostic value which can be gained by radiographic investigation of the seminal ducts.
 4. Define the following terms:
 - a. Vesiculography
 - b. Epididymography
 - c. Epididymovesiculography
 - d. Prostatography
 5. Describe the principle type of contrast medium employed for radiographic procedures of the male reproductive organs.
 6. Identify the contrast medium which may be employed in the scrotal sac in order to improve contrast in the non-screen studies of the extra-pelvic male reproductive organs.
 7. Give a specific organ of the male reproductive system, be able to demonstrate knowledge of the following:
 - a. Location of the organ
 - b. Radiographic method of instilling contrast medium
 - c. Exposure technique employed
 - d. Pathology which may be demonstrated
 8. Explain why the normal prostate gland is not radiographically demonstrable.
 9. Describe a prostate condition which is radiographically demonstrable.
 10. Give the significance of a postvoiding film (IVP) for the detection of prostatic enlargement.
 11. Be able to discuss or answer questions concerning the following positioning considerations: (Basic projections of the male reproductive organs):
 - a. part positioning (examples AP/PA, lateral, oblique)
 - b. Film/screen combination
 - c. Film size/placement/identification/markers
 - d. Beam alignment/angulation
 - e. Beam limitation/shielding
 - f. Patients instructions (void, respiration, other)
 - g. Structure(s) visualized and functions demonstrated
 - h. Pathology demonstrated

ANATOMY AND POSITIONING OF THE BREAST (A-K) (75% MINIMUM MASTERY LEVEL REQUIRED)

1. When given a diagram, radiograph, atomic model and/or description of the breast, be able to identify/locate and/or describe the function of the following:
 - a. Mammary glands
 - b. Lobes
 - c. Lobules
 - d. Alveoli
 - e. Suspensory ligaments of Cooper
 - f. Mammary ducts
 - g. Ampullae
 - h. Lactiferous ducts
 - i. Areola
 - j. Axillary lymph nodes

2. Identify the factors which must be carefully selected in order to maximize intrastructural contrast and detail in a radiograph of the breast.
3. Explain why radiography of the breast is such a challenge and describe the breast which inherently affords better radiography intrastructural contrast.
4. Explain why each mammogram have 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
5. Explain why mammography routinely is done using a) compression and b) an ion- chamber unit.
6. Explain why conventional radiography, especially with ordinary films, is inappropriate for mammography.
7. Explain how high soft-tissue contrast and superb definition needed in mammogram can be achieved by modifications of ordinary radiographic techniques giving particular attention to the following:
 - a. kVp selection
 - b. Filtration
 - c. Focus size
 - d. Film/screen/grid selection
 - e. Compression
 - f. Magnification/non-magnification technique
 - g. Collimation
8. Identify the kVp selection which affords optimum contrast of soft-tissue structures in the breast.
9. Explain why molybdenum is often used for the target of mammographic tubes.
10. Explain the combined use of molybdenum target and molybdenum filter for mammography, and explain what is meant by utilizing the principle of the spectral window.
11. Explain how the use of a beryllium window and a molybdenum target can result in radiation damage to the breast if something other than a molybdenum filter is used.
12. Explain the importance of maintaining consistent mammographic images of optimal detail and contrast.
13. Explain why it is important to be able to resolve structures as small as 0.1 mm in radiographs of the breast.
14. Explain the importance of avoiding repeats and using low-dose film-screen recording systems when radiographically examining the breast.
15. Properly describe the process of zeroradiography.
16. Identify the inventor of zerography and give the year this important tool of medicine was invented.
17. Identify a material that ordinarily behaves s an insulator, but may become a conductor when struck by light or x-rays.
18. Explain why the xerographic method is appropriate for use in x-ray examination of the breast. Give particular attention to the following:
 - a. Ionization of x-rays
 - b. Semiconductor material such as selenium
 - c. Electrostatic response
 - d. Development of the photocopying process by Xerox
19. Properly describe a xerographic latent image and explain what is necessary to make the latent image visible.
20. Explain why the Xerox plate is cleaned and heated after use and define the term, relaxation
21. Identify the advantages and disadvantages of xeroradiography in the examination of the breast.
22. Describe the uses of xeroradiography other than for radiography of the breast.
23. Give at least five (5) positive benefits of compressing the breast.
24. List the most routine projections done of the breast and describe the diagnostic value of using the positions. Explain the meaning of the right-angle projection.

25. List supplemental projections which may be done of the breast and describe the diagnostic value of using the projections.
26. Describe the role of radiology in the localization of nonpalpable tumors of the breast prior to surgical; removal of these neoplasms.
27. Identify the injection media which will permit the radiologist to localize the diseased site during radiographic and fluoroscopic examination and will also permit the surgeon to identify the mass during exploration of the breast at surgery.
28. 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.
29. Describe the critical requirements of specimen radiography in order to ensure the correct diagnosis and limit the time the patient is kept under anesthesia.
30. 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
31. Be able to discuss or answer questions concerning the following positioning or procedural considerations: (Basic projections of the breast)
 - a. Part position (examples craniocaudal, axillary, mediolateral)
 - b. Film/screen combination
 - c. Film size/placement/identification/markers
 - d. Beam alignment/angulation
 - e. Beam limitation/shielding
 - f. Patient instructions
 - 1) respiration
 - 2) hold still
 - 3) other
 - g. Structure(s) visualized and function(s) demonstrated
 - h. Pathology demonstrated

FEMALE REPRODUCTIVE SYSTEM (A-K) (75% MINIMUM MASTERY LEVEL REQUIRED)

1. Given a diagram, radiograph, atomic model or description of the organs of the female reproductive system, identify/locate the following organs and be able to describe the functions of each organ.
 - a. Ovaries (gonads)
 - b. Uterine tubes (fallopian tubes or oviducts)
 - c. Uterus
 - 1) Layers of tissue
 - a) serosa
 - b) myometrium
 - c) endometrium
 - i. stratum functionalis
 - ii. stratum basalis
 - 2) Portions of the uterus
 - a) body
 - b) cervix (neck)
 - c) superior angle (cornu)
 - i. fundus
 - d) Vagina
2. Define the following terms:
 - a. Ovulation
 - b. Zygote
 - c. Embryo

- d. Fetus
 - e. Parturition
 - f. Chorion
 - g. Amnion
 - h. Afterbirth
 - i. Placenta previa
 - j. Nongravid
 - k. Gravid
 - l. Menstruation
 - m. patent
 - n. Hydrosalpinx
 - o. Occlusion
3. Identify a particular radiographic examination of the female reproductive organs as either being appropriate for the gravid or nongravid female or for both the gravid or nongravid patient.
 4. Given the following gynecologic/radiographic examinations, define them and explain why they would be employed.
 - a. Hysterosalpingography
 - b. Pelvic pneumography
 - c. Vaginography
 5. Describe appropriate contrast media which may be employed in examinations of the female genital passages or organs.
 6. Describe the pre-procedure prep of the intestinal tract for any contrast examination of the female genital organs.
 7. Explain why gynecologic Radiologic examinations should be scheduled for the seventh or eighth day after the cessation of menstruation.
 8. Describe the post-procedure follow up for any contrast examination of the female genital organs.
 9. Describe radiation protection precautions which are taken to ensure that the least possible amount of radiation is delivered to the gonads.
 10. Explain how a hysterosalpingogram can help to diagnose patency or occlusion of the oviducts.
 11. Identify the preferred diagnostic tool for examinations of the gravid female.
 12. Given the following OB-GYN Radiologic examinations of the gravid patient, define them and explain why they would be employed.
 - a. Fetography
 - b. Pelvimetry-fetal cephalometry
 - c. Placentography
 13. Explain the need to avoid Radiologic examination of the gravid patient especially until after the first trimester of gestation.
 14. Explain the need to hyperaerate the patient prior to radiation exposure of a gravid patient.
 15. Describe the role of radiology in the extrauterine localization of intrauterine devices.
 16. Be able to discuss or answer questions concerning the following positioning or procedural considerations: (Basic projections of the gravid or nongravid patient)
 - a. Part position (examples AP-PA, lateral, oblique)
 - b. Film/screen combination
 - c. Film size/placement/identification/markers
 - d. Beam alignment/angulation
 - e. Beam imitation/shielding
 - f. Patient instructions
 - 1) preprocedure preparation of intestinal tract
 - 2) empty bladder
 - 3) respiration
 - 4) other
 - g. Structure(s) visualized and function(s) demonstrated
 - h. Pathology demonstrated

Required Assessments:

Assessment Names and Descriptions:

An examination directly related to the instructional objectives will follow completion of:

- a. Parts I-III
- b. Part IV
- c. Parts V-Vi
- d. Part VII
- e. Part VIII
- f. Part IX-X

Mastery level for each unit exam must be 75% or greater.

CSLO/Assessment Alignment:

Course	CSLO 1	CSLO 2	CSLO 3	CSLO 4	CSLO 5	CSLO 6	CSLO 7	CSLO 8	CSLO 9	CSLO 10
RT 2430	Test 1-7 final exam	Test 1-7 final exam	Test 1-7 final exam	Test 1-7 final exam	Test 1-7 final exam	Test 1-7 final exam	Test 1-7 final exam	Test 1-7 final exam	Test 1-7 final exam	Test 1-7 final exam
	CSLO 11	CSLO 12	CSLO 13	CSLO 14	CSLO 15	CSLO 16	CSLO 17	CSLO 18	CSLO 19	CSLO 20
	Test 1-7 final exam	Test 4 final exam	Test 1-7 final exam	Test 5 final exam	NA	NA	NA	NA	NA	NA

Grading Scale or Policy, Weekly Outline, Topics, or Instructional Activities:

1. 60% of the mean average of the ten unit examinations (Minimum masterly level for each unit exam is 75%)
2. 20% of the mean average of the homework assignments.
3. 20% of the score of a comprehensive final exam. (Mastery level of the final examination must be 75% or greater.)

Attendance Policy:

Class attendance and punctuality requirements are contracted between the faculty and the students, through specific expectations for attendance and punctuality and specific consequences that are outlined by individual faculty members in the printed syllabus for each course.

Students are expected to attend classes regularly and on time and are responsible for giving explanations/rationale for absences and lateness directly to the faculty member for each course in which they are enrolled.

In cases where student absences are the result of emergency circumstances (e.g., death in the family, a student’s serious injury or incapacitating illness), for which students are unable to make immediate contact with faculty, the student may contact the Office of Student Affairs for assistance in providing such immediate notification to faculty. However, the student remains responsible for verifying the emergency circumstances to faculty and for discussing arrangements with faculty for completion of course work requirements.

There will be 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
