COURSE SYLLABUS
RT 1244 – RADIOGRAPHIC POSITIONING
FILM CRITIQUE AND MEDICAL TERMINOLOGY II

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

CATALOG COURSE DESCRIPTION: This course is the second of a three course sequence in the fundamentals of radiographic positioning 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 the second course include: anatomy, topography, morphology and routine projections of contrast studies, and the cranium, and terminology, anatomy and radiography of the sella turcica, orbits, temporal bones, facial bones, mandible, temporomandibular articulations and paranasal sinuses. Laboratory assignments provide the student the opportunity for simulation and practice of the examinations prior to working with patients.

ENTRY LEVEL STANDARDS: A grade of “C” or better in RT 1145, Radiographic Positioning-Film Critique and Medical Terminology I and RT 1130, Introduction to Radiologic Technology is required for progression to this course. Having successfully completed these courses, the student should demonstrate knowledge of positioning terminology, patient care, radiation protection, image quality and anatomy and positioning of the structures covered in RT 1147. The student should also demonstrate that he / she has the knowledge and skills to perform the radiographic examinations simulated in RT 1145. In addition, the student should demonstrate a responsible attitude toward attendance, independent learning activities, class, laboratory and clinical participation and course preparation.

PREREQUISITES: RT 1145, Biol 2010

COREQUISITIES: RT 1220, Biol 2020

TEXTBOOKS AND OTHER REFERENCE MATERIAL BASIC TO COURSE:

1. Merrill’s Atlas of Radiographic Positions & Radiologic Procedures, Ballinger
3. Pocket Ballinger
4. Exploring Medical Language – A student Directed Approach, LaFleur and Starr, Mosby, e-pack

Required Student Learning Outcomes (Program Student Learning Outcomes and Course Student Learning Outcomes):

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 terminology and anatomy of the cranium and the face. (I)
CSLO# 5  Given diagrams, anatomic structures or radiographs, identify and / or locate component parts. (I)
CSLO# 6  Locate anatomy from the standpoint of the topography of anatomy and explain the relationship of organs to each other. (I)

PSLO#4. Apply quality assurance principles and perform quality control tests in order to maintain equipment and perform procedures with appropriate positioning and image quality.

CSLO# 4  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 cranium, orbits, facial bones, paranasal sinuses, temporal bones and cranial foramina. (III, VIII)

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#7 Demonstrate knowledge of word parts and rules for combining those parts into meaningful medical terms. (I)

CSLO# 8 Demonstrate the ability to analyze and define medical terms relative to the structure and function of the body. (I)

CSLO# 9 Demonstrate the ability to build, analyze, define, pronounce and spell the terms related to each of the following systems:
1. Urinary system
2. Male reproductive system
3. Female reproductive system
4. Obstetrics and neonatology
5. Eye and Ear
6. Nervous system
7. Endocrine system

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# 2 Given simulated situations which apply to the following topics, identify or describe accepted professional practice: (IV, V, VI, VIII)
1. Evaluation of radiographic orders
2. Room preparation
3. Condition of patient
4. Patient care and management

PSLO#9. Perform a full range of radiologic procedures on children and adults in all areas of the profession while performing basic functions of specialty areas within the profession.

CSLO# 3 Following the criteria below, demonstrate knowledge of and perform radiographic positioning of the cranium, orbits, facial bones, paranasal sinuses, temporal bones and special projections of the cranial foramina. (I, II, IV, VIII)
1. Part
   a. position of the body
   b. structure(s) visualized and function(s) demonstrated
   c. pathology demonstrated
2. Film size / placement / identification and R and L markers
3. Technique formulation / selection
   a. mA
   b. time
   c. kVp
   d. SID
   e. screen / film
4. Beam, film, patient alignment and CR angulation
5. Radiation protection and film quality – beam limitation / shielding
6. Patient instructions
   a. respiration
   b. other

Other Learning Indicators or Objectives (optional):
The student will be able to:

Basic Positioning of the Digestive and Urinary systems (B, C, D, E, F) – 75%
Minimum Mastery Level Required
1. 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

Contrast Medium Administration – 75% Minimum Mastery Level Required

1. State the method of administering contrast media for the:
   a. gallbladder
   b. biliary ducts
   c. esophagus
   d. stomach
   e. small bowel
   f. colon

2. State the type of contrast media generally used for radiographic examination of the:
   a. gallbladder
   b. biliary ducts
   c. esophagus, stomach, small bowel and colon

3. State the kV range which should be selected when iodinated contrast medium is used; when barium is used.

4. Describe the technique / precautions which should be used when preparing or administering contrast media for the following studies.
   a. gallbladder
   b. biliary ducts
   c. esophagus, stomach, small bowel and colon

5. Describe the general signs and symptoms of both systemic and local reactions after the administration of a contrast medium.

6. Describe the correct procedure to follow when a patient has a contrast medium reaction.

7. State the contraindications for contrast medium administration.

Gallbladder and Biliary Ducts – 75% Minimum Mastery Level Required

1. Define the term cholecystogram.

2. Define the term cholangiogram.

3. Explain the purpose for performing the cholecystographic examination.

4. Outline the specific patient preparation (diet, contrast media administration) necessary for the cholecystographic or cholangiographic examinations.

5. With the body placed in the routine positions, describe the use of external landmarks to locate the gallbladder and biliary ducts so that they can be imaged on an appropriate size film.

Esophagus – 75% Minimum Mastery Level Required

1. Explain the purpose for performing an examination of the esophagus.

2. Outline the specific preparation, if any, necessary for esophageal examination.

3. For the routine positions of the esophagus, describe the method for localization of the esophagus so that it can be imaged on an appropriate size film.

4. State the importance of using a short exposure time when radiographing the esophagus: give an appropriate time.

Stomach and Small Bowel – 75% Minimum Mastery Level Required

1. Explain the purpose for performing the stomach and small bowel examination.

2. Outline the specific preparation necessary for stomach and small bowel examination.

3. For routine positions of the small bowel / stomach, describe the method for localization of the small bowel / stomach so that it can be imaged on an appropriate size film.

4. State the importance of using a short exposure time when radiographing the small bowel / stomach; give an appropriate time.

5. Explain the purpose of fluoroscopy in examinations of the stomach / small bowel.

6. Explain the need to include the stomach on radiographs of the small bowel until the stomach has emptied.

Colon – 75% Minimum Mastery Level Required

1. Explain the purpose for performing radiologic and fluoroscopic examination of the colon.
2. Outline the specific preparation necessary for colon examination.
3. For routine positions of the colon, describe the method for localization of the colon so that it can be imaged on an appropriate size film.
4. Describe appropriate patient care techniques to be used in the administration of an enema (including proper assistance to the radiologists and proper placement of the enema tip).

Urinary System – 75% Minimum Mastery Level Required
1. Explain the reason for IVP examination.
2. Outline the specific preparation necessary for kidney examination.
3. For routine positions of the kidneys, describe the method for localization so that the kidneys can be imaged on an appropriate size film.
4. State the importance of using sterile technique when drawing up or administering a contrast medium.
5. Describe the proper use and position of a ureteric compression band.
6. Explain the importance of making exposures at the prescribed times.
7. Explain the need to have appropriate patient history before a contrast medium is injected.
8. State who is permitted to inject the contrast medium.

Anatomy of the Head and Face (A, E, F) – 75% Minimum Mastery Level Required
1. Name the two major divisions of the skeleton of the head and list / identify the bones which make u each division.
2. Define the following:
   a. suture
   b. diploe
   c. meningeal groves
   d. meningeal groves
   e. fontanel
   f. bregma
   g. lambda
   h. clivus
3. Describe a typical newborn cranium with respect to mineralization and areas of incomplete ossification.
4. Describe a typical first to third month after birth cranium.
5. Describe a typical second year after birth cranium.
6. Describe a typical adult cranium and discuss its characteristics comparing subject to subject and the atrophy of old age.
7. Describe an average (normal) cranium relative to width, length and depth.
8. With respect to the normal width-to-length measurement of the external cranium, describe the correction for internal deviation based on a 1 cm change in the 3 cm width-to-length measurement.
9. Given a description, diagram, anatomic model or radiograph of the cranium or face, identify and / or locate the following:
   CRANIUM (8 bones)
   a. frontal bone
      1) vertical portion (squama)
      2) horizontal portion
      3) superciliary arches
      4) glabella
      5) nasion
      6) frontal air sinuses
   b. ethmoid
      1) horizontal plate (cribriform plate)
      2) crista galli
      3) vertical plate
      4) lateral masses
         a) ethmoidal air sinuses
         b) superior and middle nasal conchae
   c. parietals
      1) parietal eminence
      2) bregma
      3) lambda
d. sphenoid sinus
   1) body
      a) sphenoid sinus
   2) sella turcica
      a) tuberculum sellae
      b) dorsum sellae
      c) anterior and posterior clinoid processes
   3) optic groove
   4) small wings
      a) posteromedial portion of the roofs of the orbits
      b) posterior portion of anterior cranial fossa
      c) upper margin of superior orbital fissures
      d) anterior clinoid processes
      e) optic canals
      f) sphenoid strut
   5) great wings
      a) middle fossa of cranium
      b) posterolateral walls of orbits
      c) lower margin-superior orbital fissure
      d) posterior margins of inferior orbital fissure
      e) foramina rotundum
      f) foramina spinosum
      g) pterygoid processes

e. occipital
   1) squama
   2) internal / external occipital protuberance (inion)
   3) lateral portions
   4) foramen magnum
   5) occipital condyles
   6) jugular process (jugular foramen)
   7) hypoglossal canal
   8) basilar portion

f. temporals
   1) squamous portion
   2) zygomatic process
   3) tympanic portion
   4) styloid process
   5) mastoid portion
   6) petrous portion
      a) external ear and component parts
      b) middle ear and component parts
         i. malleus
         ii. incus
         iii. stapes
      c) inner ear
         i. labyrinth
         ii. vestibule
         iii. semicircular canals
         iv. cochlea
      d) internal auditory canal

FACE (14 bones)
   a. nasals (two)
   b. lacrimals (two)
   c. maxillae (two)
      1) maxillary sinus
      2) alveolar process
      3) canine fossa
4) anterior nasal spine (acanthion)

d. zygoma / malar (two)
   1) part of side wall and floor of the orbits
   2) temporal process

e. palatines (two)
   1) posterior ¼ of the roof of the mouth
   2) part of nasal cavity
   3) small portion of the posteromedial part of the orbital cavities

f. inferior nasal conchae (two)
g. vomer

h. mandible
   1) body
   2) rami
   3) mental protuberance
   4) alveolar process
   5) mental foramina
   6) coronoid
   7) condyloid process
   8) mandibular notch
   9) hyoid – not really a portion of the mandible

10. Associate the nasion as being the frontonasal suture.

11. Identify the following as being the paranasal sinuses:
    a. frontal
    b. ethmoid
    c. sphenoid
    d. maxillary

12. State the location of each paranasal sinus.

13. Identify the superior and middle nasal conchae or turbinates as being part of the lateral mass of the ethmoid bone.

14. Identify the arched ridges which correspond in position to the eyebrows.

15. Identify the sinuses which are not paranasal sinuses.

16. Identify the structure which is perforated by many foramina for the transmission of the olfactory nerves, which are the nerves of smell.

17. Identify the thickest, most dense bone in the cranium.

18. Identify the portion of the temporal bones which contain the organs of hearing.

19. Describe the development of the mastoid processes of the temporal bone.

20. Associate the crista galli as being a thick, conical process of the ethmoid bone.

21. Associate the pterygoid processes as being inferior / basilar projections of the sphenoid bone.

22. Identify the aperture of the occipital bone which transmits the medulla oblongata.

23. Identify the depression on the superior surface of the body of the sphenoid bone which lodges a gland known as the pituitary body.

24. When given a description of the following structures, identify them:
    a. external ear
    b. middle ear
    c. internal ear
    d. malleus
    e. incus
    f. stapes

25. Match the following foramina, processes or fissures with the appropriate bone or bones which forms them:
    a. optic canal
    b. foramina rotundum
    c. foramina ovale
    d. foramina spinosum
    e. pterygoid processes
    f. crista galli
    g. internal auditory canal
    h. jugular foramina
    i. hypoglossal canals
Radiography of the Skeleton of the Head – Routine Projections (B, C, D) – 75% Minimum Mastery Level Required

1. Explain the importance of correct body position to radiography of the cranium.

2. When doing a lateral projection of the cranium, describe the body adjustment which is necessary for:
   a. a hyposthenic patient
   b. a hypersthenic patient

3. When doing an AP projection of the cranium, describe the body adjustment when is necessary for a round-shouldered patient.

4. When doing a PA projection of the cranium, describe the body adjustment which is necessary for:
   a. hyposthenic patient
   b. hypersthenic patient
5. Be able to discuss or answer questions concerning the following positioning considerations: (all projections demonstrating lateral cranial structures, projections demonstrating lateral cranial structures, anterior cranial structures, posterior cranial structures and basal cranial structures).
   a. part position (examples – AP, PA, lateral and submentovertex / verticosubmentum)
   b. film size / placement / identification / markers
   c. beam angulation and alignment to part and film
   d. structure(s) visualized a function(s) demonstrated
   e. pathology demonstrated
   f. patient instructions
      1) respiration
      2) other

6. Identify the projections which would completely demonstrate every aspect of the general skeleton of the head-
   anterior, posterior, lateral and basilar.

7. Explain what is meant by a reverse duplicate; give examples of situations which may necessitate reverse
duplicates; explain the importance of placing the structure as close to the film as possible; and explain how one
would be able to recognize a projection in which the part was NOT placed in contact with the film.

8. Give examples of cranial projections which if small modifications such as more collimation or different
   centering are applied, may be used for the demonstration of more than one structure.

9. Evaluate a lateral, PA, AP, or basilar projection of the cranium for positioning or procedural accuracy.

10. Explain the value of cross-table (horizontal ray) lateral projection of the skull relative to sphenoid sinus
    effusion.

11. Explain how a sphenoid sinus effusion may indicate a basal skull fracture.

12. For a lateral projection of the cranium, explain the importance / significance of the following:
    a. parallelism of sagittal plane and film
    b. head flexed to place the infraorbitomeatal line parallel with the transverse axis of the film
    c. interpupillary line perpendicular to the film plane

13. Given a diagram, anatomic model or radiograph of the cranium, identify and / or locate the following:
    a. lateral projection
       1) frontal bone
       2) parietal bones
       3) coronal suture
       4) lambdoidal suture
       5) squamous suture
       6) sella turcica (dorsum sellae / tuberculum sellae)
       7) posterior / anterior clinoid processes
       8) sphenoid sinus
       9) diploe
       10) TMJ and mandibular rami
       11) mastoid region of the temporal bone
       12) EAM (external auditory meatus)
    b. PA projection
       1) frontal bone
       2) parietal bones
       3) sagittal suture
       4) frontal and ethmoid sinuses
       5) crista galli
       6) petrous ridge
       7) orbital shadows
    c. AP projection
       1) parietal bone
       2) occipital bone
       3) foramen magnum
       4) petrous ridge (internal auditory canal)
       5) posterior clinoid processes / dorsum sellae
       6) lambdoidal suture
    d. Basal projection
       1) maxillary
       2) ethmoid sinus
3) mandible
4) vomer
5) sphenoid sinus
6) clivus
7) foramen spinosum
8) foramen magnum
9) foramen ovale
10) petrous ridge (internal auditory canals)
11) carotid canals
12) sphenoid and occipital bones

14. Relative to the petrous ridge and orbits and other structures which may be better demonstrated, compare and contrast a PA projection of the cranium using:
   a. 15 degree caudal angulation of the beam
   b. a perpendicular beam (CR)
   c. a 20-25 degree caudal angulation
   d. a 25-30 degree caudal angulation

15. Identify a specific projection of the skull with the method of examination (proper name).

16. Identify the projection(s) or positioning method(s) which would demonstrate the following structures:
   a. internal auditory canals
   b. sella turcica
   c. foramen ovale
   d. foramen spinosum
   e. foramen lacerum
   f. carotid canals
   g. anterior, posterior, lateral and basal cranial structures

17. Differentiate the “Modified Caldwell” from the “True Caldwell” position.

18. Identify the following as being reverse duplicates:
   a. R lateral – L lateral
   b. AP-PA perpendicular CR
   c. AP, CR angle of 30-37 degrees caudal – PA, CR angle of an average 50 degrees cephalad (Haas method)
      or PA infraorbitomeatal line 50 degrees to film plane, CR perpendicular to film plane
   d. submentovertical-verticosubmental
   e. PA, CR angle 15 degrees caudal-AP, CR angle 15 degrees cephalad

19. Identify the projection in which the infraorbitomeatal line always placed parallel to the film plane or the CR is angled to accomplish the parallelism.

20. For the Grashey method of posterior cranial demonstration, explain a 30 degree caudal angulation of the CR when the orbitomeatal line is used as opposed to a 37 degree caudal angulation of the CR when the infraorbitomeatal line is used.

21. Give the method of cranial evaluation which will demonstrate the dorsum sellae and posterior clinoid processes within or slightly above the shadow of the foramen magnum and the tuberculum sellae and anterior clinoid processes just below this point.

22. For all projections of the cranium, explain the significance / importance of the petrous aspect of the temporal bone and describe its influence on radiographic positioning of the cranium.

Cranium and Sella Turcica (continued) (1-F) – 75% Minimum Mastery Level Required

*1. Be able to discuss or answer questions concerning the following positioning considerations: (PA axial projection-Valdini method, lateral AP axial projection-Grashey method, PA axial projection-Haas method, PA projection -10 degree cephalad)
   a. part position (examples – AP, lateral or PA)
   b. structure(s) visualized and function(s) demonstrated
   c. pathology demonstrated
   d. film / screen combination used
   e. film size / placement / identifications / markers
   f. beam angulation and alignment to part and film
   g. beam limitation / shielding
   h. patient instructions
      1) respiration
      2) other
2. Given a diagram, anatomic model or radiograph, identify and / or locate the following structures:
   a. sella turcica
   b. tuberculum sellae
   c. dorsum sellae
   d. posterior / anterior clinoid processes
3. Describe the positive outcome of examining the dorsum sellae using the Valdini method.
4. Explain the need for elevation of the thorax for the recumbent projection of the dorsum sellae using the Valdini method.
5. Describe the following structures:
   a. dorsum sellae
      1) IAC (internal auditory canals)
      2) labyrinths of the ears
   b. EAM (external auditory canals)
      1) tympanic cavities
      2) bony portion of eustachian tubes
6. Describe The adjustment in CR centering for:
   a. dorsum sellae demonstration
   b. petrosae
7. Describe the evaluation criteria used to determine the accuracy of positioning when radiographing the sellae turcica or petrosae using the Valdini method.
8. Compare and contrast a lateral projection of the head with a lateral projection of the sellae turcica.
9. Describe the evaluation criteria used to determine the accuracy of positioning when radiographing the sellae turcica in the lateral position.
10. Compare and contrast an AP axial projection (Grashey method) of the cranium with the same projection of the sellae turcica.
11. Describe the change in the projection of anatomy which will result if one were to use a 30 degree angulation of the CR (AP axial projection) as opposed to a 37 degree angulation of the CR.
12. Describe the evaluation criteria used to determine the accuracy of positioning when radiographing the sellae turcica using the AP axial projection (Grashey method).
13. Compare the contrast and the demonstration of the sellae turcica using the Haas method with that for the entire cranium using the same method.
14. Describe the evaluation criteria used to determine the accuracy of positioning of the sellae turcica using the Haas method.
15. Describe the demonstration of the sellae turcica when the PA projection 10 degree cephalad angulation is used.
16. Describe the evaluation criteria used to determine the accuracy of positioning of the sellae turcica using the PA – 10 degree cephalad angulation projection.

Anatomy and Radiography of the Orbits (A-F) – 75% Minimum Mastery Level Required
1. Identify / list the bones which form the orbits.
2. Identify the structure which majorly forms the following:
   a. roof of the orbit
   b. floor of the orbit
   c. apex of the orbit
3. Describe the general location of the orbit relative to its long axis relationship to the midsagittal plane and the orbitomeatal line.
4. Describe the bones which form the following orbital clefts:
   a. superior orbital / sphenoidal fissure
   b. inferior orbital / sphenomaxillary fissure
6. Explain what clouding of the maxillary sinus following trauma to eye may indicate.
7. Identify the most routine radiographic methods of demonstrating a blowout fracture of the orbit.
8. Identify the foramina which transmits the optic nerve and ophthalmic artery from the brain to the eye.
9. Identify the root of one which forms the floor and part of the lateral wall of the optic canal.
10. Identify the BEST projection to demonstrate a blowout fracture of the orbit.
11. Identify the radiographic technique or procedure used most often to demonstrate the extent of a blowout fracture of the orbit.
12. *Be able to discuss or answer questions concerning the following positioning considerations: (projections for the bones of the orbit, optic foramina, superior orbital fissures and inferior orbital fissures)
   a. part position (examples-parieto-orbital oblique and orbitoparietal oblique)
   b. structure(s) visualized and function(s) demonstrated
   c. pathology demonstrated
   d. film / screen combination used
   e. film size / placement / identification / markers
   f. beam angulation and alignment to part and film
   g. beam limitation / shielding
   h. patient instructions
      1) respirations
      2) mouth open
      3) phonation
      4) other

13. Identify from a list or list the projections which may be used to demonstrate the optic foramina.

14. When examining the optic foramina, give the reason for the rotation and extension of the head such that the sagittal plane forms a 53 degree angle with the plane of the film and the acanthomeatal line is perpendicular to the film plane.

15. For the Rhese, reverse Rhese or Alexander methods, describe the location of the optic canal relative to the whole orbit.

16. Give the positioning error which may be indicated by:
   a. a lateral deviation of the optic foramen from the outer quadrant
   b. longitudinal deviation of the optic foramen from the lower quadrant

17. Compare and contrast the routine Rhese method of optic foramina demonstration with that of an exact reverse Rhese.

18. Compare and contrast the reverse Rhese method of optic foramina demonstration with the Alexander method.

19. Differentiate the modified Lysholm method of the optic foramina demonstration with the other methods of demonstration of this structure.

20. Explain the importance / significance of the radiographic demonstration of the sphenoid strut.

21. Associate the sphenoid strut with the inferior root of the lesser wing of the sphenoid bone.

22. Associate the Hough method with the radiographic demonstration of sphenoid strut.

23. Relative to demonstration of the superior orbital fissures and the petrosae, compare and contrast a modified Caldwell of the cranium with a PA axial projection of the superior orbital fissures.

24. Evaluate a PA axial projection of the orbits for positioning and procedural accuracy.

25. Compare and contrast the Haas method of cranial demonstration with the PA axial projection (Bertel method) of inferior orbital fissure demonstration.

26. Evaluate a PA axial projection Bertel method for positioning and procedural accuracy.

27. Given a diagram, anatomic model or radiograph, identify and / or locate the following structures / portions of the orbit:
   a. floor
   b. roof
   c. medial aspect
   d. lateral aspect
   e. optic foramen
   f. superior orbital fissure
   g. inferior orbital fissure

28. Describe the location of the superior orbital fissure when projected by the PA axial projection; describe the location of the inferior orbital fissure when projected by the PA axial 20-25 degree cephalad projection.

Facial Bones (A-F) – 75% Minimum Mastery Level Required

*1. Be able to discuss or answer questions concerning the following positioning considerations: (all bones of the face)
   a. part position (examples – parieto-orbital oblique and orbitoparietal oblique)
   b. structure(s) visualized and function(s) demonstrated
   c. pathology demonstrated
   d. film / screen combination used
   e. film size / placement / identification / markers
   f. beam angulation and alignment to part and film
g. beam limitation / shielding
h. patient instructions
   1) respiration
   2) mouth open
   3) phonation
   4) other

2. Name the most common projections done to survey the facial bones.
3. Compare and contrast the lateral projection of the facial bones with the lateral projection of the cranium.
4. Evaluate a lateral projection of the facial bones for positioning and procedural accuracy.
5. Describe the method which may be used to demonstrate the relation between the bony and soft tissue structures of the face with only one exposure.
6. Identify the overall best projection to demonstrate the ones of the face.
7. For a Waters projection, explain the importance / significance of a 37 degree placement of the orbitomeatal line with the plane of the film.
8. Associate the AP axial projection using a 30 degree cephalad angulation as being the reverse of the standard Waters method of facial bone demonstration.
9. State when the reverse Waters method would be indicated and explain the drawbacks of using this projection.
10. Identify the PA oblique projection of the facial bones as being similar to the Rhese method which is used to demonstrate optic foramina. Compare and contrast the two methods.
11. Given a diagram, anatomic model or radiograph of the facial bones, identify and / or locate specified structures.
12. Evaluate a lateral, parietoacanthial (Waters), AP axial and PA oblique for positioning or procedural accuracy.
13. Explain the benefit of using a direct exposure for nasal bone demonstration in the lateral projection.
14. Explain the significance / importance of using intensifying screens to demonstrate the nasal bones in the lateral projection.
15. Explain the overall importance of a lateral projection of the nasal bones; of a superior-inferior projection of the nasal bones.
16. Describe the method used to demonstrate the zygomatic arches bilaterally.
17. Compare and contrast the submentovertical projection of the skull with the submentovertical projection of the zygomatic arches.
18. Describe the patient or patient injury which will negate the use of the submentovertical projection for zygomatic demonstration. Describe the other options which may be used to demonstrate the arches.
19. Identify the most common projections used for a survey of the zygomatic arches.
20. Compare and contrast the PA axial (superoinferior) projection (modified Titterington method) with a Waters method of zygomatic arch demonstration.
21. Identify the patient who is best examined using a slight oblique axial projection – tangential of the zygomatic arches.
22. Identify the zygomatic arch which will be demonstrated using the following:
   a. AP oblique axial (tangential)
   b. PA oblique axial (tangential-May method)
23. Compare and contrast the AP axial projection of the zygomatic arches with the Grashey-Town methods of posterior cranial structure demonstration. (Examples – film size and placement, collimation and CR)
24. Differentiate a PA / PA axial projection with the patient’s head rested on the nose and chin with the PA / PA axial projection with the patient’s head rested on the forehead and nose.
25. Describe a frontal projection which may be used when demonstration of the mandibular body is the main objective.
26. Describe a frontal projection which may be used when demonstration of the mandibular rami and temporomandibular joints are the main objectives.
27. Describe how filling the mouth with air may be helpful in a PA axial projection of the mandible.
28. Describe a frontal projection which will provide a general survey of the mandible, particularly the rami. With the same positioning of the head, describe the adjustment which must be made to demonstrate the mandibular condyles.
29. Identify the projection which will demonstrate “Best” any medial or lateral displacement of the fragments in fractures of mandibular rami.
30. Evaluate all frontal projections of the mandible for positioning and procedural accuracy.
31. Explain why the mentum of the mandible is not well visualized in frontal projections of the mandible.
32. State the main objectives of a PA / AP axiolateral projection of the mandible.
33. Describe the film / mandibular body relationship in both the AP / PA axiolateral projection of the mandible.
34. For an AP axiolateral projection of the mandible, describe the adjustment in positioning when:
   a. the posterior two thirds of the mandibular body is the objective
   b. the anterior third of the mandibular body is the objective
   c. the mandibular ramus if the main objective
35. For a PA axiolateral projection of the mandible, describe the adjustment in positioning when:
   a. the body of the mandible from the angle to the region of the canine is the main objective
   b. the symphysis mentum is the main objective
   c. the mandibular ramus (except the condyle) and the angle and posterior part of the body of the
      mandible are the primary objective
36. For a verticosubmental or submentovertical projection of the mandible describe the variation in structures
    demonstrated:
   a. when the CR is directed perpendicular to the occlusal plane
   b. when the CR is directed perpendicular to the infraorbitomeatal line
37. Evaluate all axiolateral and basal projections of the mandible for positioning and procedural accuracy.
38. Explain the significance / importance of making sure a patient is occluding the posterior rather than the
    anterior teeth during TMJ studies in the closed position.
39. Explain the significance / importance of making sure for an open-mouth projection of the TMJs that the
    mandible does not jut forward.
40. Give a contraindication for an open-mouth maneuver of the mandible and give the reason for the
    contraindication.
41. Identify the radiologic procedure which may be indicated for examination of TMJs when a fracture or
    dislocation is suspected.
42. Compare and contrast an AP axial projection of the mandible with an AP axial projection (Grashey-Town
    method) of the cranium or zygomatic arches.
43. Give the location of the TMJ relative to the EAM (external auditory meatus).
44. For radiographic demonstration of the TMJs in a lateral position, explain the need for a 25 or 30 degree caudad
    angulation of the central ray. Give the significance / importance of the sagittal plane being parallel to the film
    plane.
45. Explain the significance of examining the TMJs in both an open and a closed mouth position and of examining
    both TMJs even if only one is affected.
46. State the primary objective of any projection designed for demonstration of the temporomandibular
    articulations.
47. Evaluate all radiographic projections of the TMJs for positioning or procedural accuracy.

Anatomy and Radiography of the Paranasal Sinuses (A-F) – 75% Minimum Mastery Level Required
1. Explain the term paranasal when referring to the sinuses.
2. Explain why a limited paranasal sinus study is performed on infants.
3. Give the sinuses which are sufficiently well developed and aerated at birth.
4. Give the average age of full development of the paranasal sinuses.
5. In terms of a specific name for the paranasal sinuses, explain the reference to a particular bone.
6. Given a list of the paranasal sinuses, correctly identify their drainage into the nasal cavity.
7. Associate the maxillary sinuses as being the antra of Highmore.
8. Relative to radiography of the paranasal sinuses, be able to discuss or answer questions concerning the
    following positioning considerations:
   a. part position (example – Waters, PA lateral and submentovertical projections)
   b. structure(s) visualized and function(s) demonstrated
   c. pathology demonstrated
   d. film / screen combination used
   e. film size / placement / identifications / markers
   f. beam angulation and alignment to part and film
   g. beam limitation / shielding
   h. patient instructions
      1) respirations
      2) other
9. Given a diagram, anatomic model or radiograph, identify and / or locate the following structures and describe
    their relationship to each other and surrounding parts:
   a. frontal sinuses
   b. ethmoid sinuses
c. sphenoid sinuses
d. maxillary sinuses

10. In terms of proper density, give the criterion used to judge a properly exposed sinus radiograph.

11. For projections of the sinuses, explain the problem of overpenetration, under-penetration, and too much contrast.

12. Explain the significance / importance of erect positioning when the sinuses are radiographed.

13. Explain the need to position the patient for the demonstration of a particular paranasal sinus and waiting several minutes before the exposure is made.

14. Give the standard projection(s) which adequately demonstrate all of the paranasal sinuses and describe the radiographic value of each.

15. From the following projections, identify the projection(s) which best demonstrate(s) particular paranasal sinus group(s):
   a. Caldwell
   b. Waters
   c. lateral
   d. submentovertical
   e. verticosubmental

16. Identify the projections commonly employed after the sinuses have been injected with an opaque medium.

17. Define sinography.

18. Explain the significance / importance of removing dentures, hairpins, earrings and necklaces before proceeding with any facial or craniographic procedures.

19. Identify the projection of the cranium which will demonstrate the depth and extent of the paranasal sinuses.

20. Explain the use of a 72” FFP when a lateral projection of the paranasal sinuses is to be used for preoperative measurements.


22. State the main objective of the Waters method of maxillary sinus demonstration. Explain how this is accomplished including head position and orbitomeatal line angulation to the film plane.

23. Compare and contrast the routine projections of the paranasal sinuses with similar corresponding projections of the facial bones or cranial bones.

24. Give the method of sphenoid sinus examination which will demonstrate the sinuses through the open mouth.

25. Evaluate all projections used for the examination of the paranasal sinuses for positioning or procedural accuracy.

26. Explain the importance of demonstrating the relationship of the maxillary teeth to the antral floor before extraction of a tooth.

Radiography of the Temporal Bones (A-F) – 75% Minimum Mastery Level Required
1. Given an anatomical or physiological description of the specific portions of the temporal bone, identify or locate a particular aspect or part.
2. Identify the structure which collects sound waves and directs them inward by way of the external auditory meatus to the ear drum.
3. Identify the structure which connect the middle ear with the nose and nasopharynx.
4. Relative to external, middle or internal ear, locate the auditory ossicles.
5. Name the three auditory ossicles.
6. Identify the auditory ossicle which attaches the ear drum and the incus.
7. Properly associate the following:
   a. malleus – hammer (outermost ossicle)
   b. incus – anvil (middle ossicles)
   c. stapes – stirrup (innermost ossicle)
8. Identify the auditory ossicle which attaches the hammer-shaped bone with the stirrup-shaped bone.
9. Identify the auditory ossicle which connects the incus with the inner ear.
10. Identify the portion of the ear and temporal bone which contains the sensory apparatus of hearing and equilibrium.
11. Name the three areas of the inner ear.
12. Identify the structure which communicates with the middle ear by way of the stapes and contains two sacs, the utricle and the saccule.
13. Identify the structure which contains the sensory apparatus of equilibrium.
14. Properly associate the sensory nerve of hearing as being the auditory nerve, the acoustic nerve or the 8th cranial nerve.

15. Relative to radiography of the temporal bones, be able to discuss or answer questions concerning the following positioning considerations:
   a. part position (examples lateral, Stenvers, Mayers and Schullers)
   b. structure(s) visualized and function(s) demonstrated
   c. pathology demonstrated
   d. film / screen combination used
   e. film size / placement / identification / markers
   f. beam angulation and alignment to part and film
   g. beam limitation / shielding
   h. patient instructions
      1) respiration
      2) other

16. Identify the projections of the temporal bones which require that the auricle of the ear be folded forward. Explain the purpose of this maneuver.

17. Give the criteria which must be met to obtain projections of sharp outlines of the thin, fragile walls of the mastoid cells.

18. For a lateral projection of the mastoid region as described by Law give the specifics concerning angulation of the central ray. Describe two other methods which may be used to simulate the Law method.

19. Describe the measures which must be taken to obtain an unobstructed lateral image of the mastoid portion of the temporal bones.

20. Given a lateral radiograph or diagram of the mastoid portion of the temporal bone, identify / locate the following structures:
   a. tegmen tympani
   b. mastoid antrum
   c. mastoid air cells
   d. superimposed internal and external auditory meatuses
   e. mandibular condyle
   f. mastoid process

21. Relative to CR angulation and placement of film, compare the following projections of the mastoid and petrous portions of the temporal bone:
   a. Henschen
   b. Schuller
   c. Lysholm

22. Given a list of cranial projections, select those which are good for demonstration of the internal auditory canals.

23. Compare and contrast the following projections of the temporal bones with similar projections done of other areas of the cranium:
   a. PA – transorbital method
   b. AP – axial projection (Grashey method)
   c. PA axial projection – Haas method
   d. PA axial projection – Valdini method
   e. submentovertical (subbasal) projections

24. State the value of the Mayers and Owen method of petrous portion demonstration and differentiate with the Schullers or Laws method.

25. Give two methods which are routinely used to demonstrate the internal auditory canals in profile. Identify the method which is better to use and explain the choice.

26. For the Stenvers or Arcelin method of temporal bone study, describe the position of the petrosa relative to the film plane.

27. Evaluate projections of the temporal bones for positioning or procedural accuracy.

Medical Terminology Objectives
Urinary System (C, E) – 75% Minimum Mastery Level required
1. Define the anatomical terms of the urinary system.
2. Give the definitions of the word parts included in this chapter.
3. Build, analyze, define, pronounce, and spell the diagnostic terms related to the urinary system.
4. Define, pronounce, and spell other diagnostic terms related to the urinary system.
5. Build, analyze, define, pronounce, and spell the surgical terms related to the urinary system.
6. Build, analyze, define, pronounce, and spell the diagnostic procedural terms related to the urinary system.
7. Build, analyze, define, pronounce, and spell additional terms related to the urinary system.
8. Define, pronounce, and spell the other additional terms related to the urinary system.

Male Reproductive System (C, E) – 75% Minimum Mastery Level Required
1. Define the anatomical terms of the male reproductive system.
2. Give the definitions of the word parts included in this chapter.
3. Build, analyze, define, pronounce, and spell the diagnostic terms related to the male reproductive system.
4. Define, pronounce, and spell other diagnostic terms related to the male reproductive system.
5. Build, analyze, define, pronounce, and spell the surgical terms related to the male reproductive system.
6. Define, pronounce, and spell other surgical terms related to the male reproductive system.
7. Build, analyze, define, pronounce, and spell additional terms related to the male reproductive system.
8. Define, pronounce, and spell the other additional terms related to the male reproductive system.

Female Reproductive System (C, E) – 75% Minimum Mastery Level Required
1. Define the anatomical terms of the female reproductive system.
2. Give the definitions of the word parts included in this chapter.
3. Build, analyze, define, pronounce, and spell the diagnostic terms related to the female reproductive system.
4. Define, pronounce, and spell other diagnostic terms related to the male reproductive system.
5. Build, analyze, define, pronounce, and spell the surgical terms related to the female reproductive system.
6. Define, pronounce, and spell other surgical terms related to the female reproductive system.
7. Build, analyze, define, pronounce, and spell additional terms related to the female reproductive system.
8. Define, pronounce, and spell the other additional terms related to the female reproductive system.
9. Define, pronounce, and spell the other additional terms related to the female reproductive system.

Obstetrics and Neonatology (C, E) – 75% Minimum Mastery Level Required
1. Define the anatomical terms relating to pregnancy.
2. Give the definitions of the word parts included in this chapter.
3. Build, analyze, define, pronounce, and spell the diagnostic terms related to obstetrics.
4. Define, pronounce, and spell other diagnostic terms related to obstetrics.
5. Build, analyze, define, pronounce, and spell the diagnostic terms related to neonatology.
6. Define, pronounce, and spell other diagnostic terms related to neonatology.
7. Build, analyze, define, pronounce, and spell the surgical and diagnostic procedural terms related to obstetrics and neonatology.
8. Build, analyze, define, pronounce, and spell additional terms related to obstetrics and neonatology.
9. Define, pronounce, and spell the other additional terms related to obstetrics and neonatology.

Nervous System (C, E) – 75% Minimum Mastery Level Required
1. Define the anatomical terms of the musculoskeletal system.
2. Give the definitions of the word parts included in this chapter.
3. Build, analyze, define, pronounce, and spell other diagnostic terms related to the nervous system.
4. Define, pronounce, and spell other diagnostic terms related to the nervous system.
5. Build, analyze, define, pronounce, and spell the surgical terms related to the nervous system.
6. Build, analyze, define, pronounce, and spell the surgical procedural terms related to the nervous system.
7. Define, pronounce, and spell other diagnostic procedural terms related to the nervous system.
8. Build, analyze, define, pronounce, and spell additional terms related to the nervous system.
9. Define, pronounce, and spell the other additional terms related to the nervous system.

Eye (C, E) – 75% Minimum Mastery Level Required
1. Define the anatomical terms of the eye.
2. Write the definitions of the word parts included in this chapter.
3. Build, analyze, define, pronounce, and spell the diagnostic terms related to the eye.
4. Define, pronounce, and spell other diagnostic terms related to the eye.
5. Build, analyze, define, pronounce, and spell the surgical terms related to the eye.
6. Define, pronounce, and spell other surgical terms related to the eye.
7. Build, analyze, define, pronounce, and spell the diagnostic procedural terms related to the eye.
8. Build, analyze, define, pronounce, and spell the other additional terms related to the eye.
8. Build, analyze, define, pronounce, and spell additional terms related to the eye.
9. Define, pronounce, and spell and other additional terms related to the eye.

Ear – (C, E) – 75% Minimum Mastery Level Required
1. Define the anatomical terms of the ear.
2. Give the definitions of the word parts included in this chapter.
3. Build, analyze, define, pronounce, and spell the diagnostic terms related to the ear.
4. Define, pronounce, and spell other diagnostic terms related to the ear.
5. Build, analyze, define, pronounce, and spell the surgical terms related to the ear.
6. Build, analyze, define, pronounce, and spell the diagnostic procedural terms related to the musculoskeletal system.
7. Build, analyze, define, pronounce, and spell additional terms related to the ear.

Endocrine System (C, E) – 75% Minimum Mastery Level Required
1. Define the anatomical terms of the endocrine system.
2. Give the definitions of the word parts included in this chapter.
3. Build, analyze, define, pronounce, and spell the diagnostic terms related to the endocrine system.
4. Define, pronounce, and spell other diagnostic terms related to the endocrine system.
5. Build, analyze, define, pronounce, and spell the surgical terms related to the endocrine system.
6. Build, analyze, define, pronounce, and spell additional terms related to the endocrine system.
7. Define, pronounce, and spell the other additional terms related to the endocrine system.

PROCEDURE PRACTICE (Using Phantoms-Energized Lab)
The student will, in a laboratory situation and given a phantom:
1. Correctly position the phantom for a specific position, stabilizing or immobilizing as needed.
2. Select the correct film size.
3. Align the x-ray tube to part and film.
4. Adjust the cone or collimator to appropriate field size.
5. Demonstrate the application of necessary protective shielding.
6. Measure the part, using the caliper properly.
7. Select the exposure technique.
8. Expose the film.
9. Evaluate image quality:
   a. positioning
   b. radiographic technique
   c. collimator adjustment and radiation protection
   d. film I.D.
   e. tube-patient-film alignment
10. Locate / identify structures shown.

PROCEDURE PERFORMANCE – ENERGIZED LAB OR CLINICAL ASSIGNMENT
(Using live subject – no radiation exposure)
The student will:
1. Under laboratory conditions utilizing a live model:
   a. evaluate a requisition to determine the positions required
   b. introduce self to “patient” and explain exam
   c. verify correct identification of “patient”
   d. verify correct preparation, if any, of “patient”
   e. prepare radiographic equipment
   f. place “patient” on x-ray table
   g. select appropriate film
   h. position “patient” longitudinally and transversely
   i. immobilize as necessary
   j. align tube and film
   k. adjust collimator to appropriate field size
   l. apply gonadal shields if required
   m. measure part
n. select appropriate technique
o. instruct “patient”
p. make mock exposure(s)
q. repeat for each view required
r. assist “patient” from table

2. Using example films, evaluate image quality as to:
   a. positioning
   b. radiographic technique
c. collimator adjustment
d. film I.D.
e. tube-patient-film alignment
f. proper identification / demonstration of structures

Required Assessments:

Assessment Names and Descriptions:

A. TESTING PROCEDURES:
   An examination directly related to the instructional objectives will follow completion of:
   1. Contrast Studies
   2. Anatomy and Radiography of the Cranium
   3. Anatomy and Radiography of Facial Bones
   4. Anatomy and Radiography of Sinuses, Mastoids, and Temporal Bone

   and at the end of each Medical Terminology Chapter:
   1. Urinary System
   2. Male Reproductive System
   3. Female Reproductive System
   4. Obstetrics and Neonatology
   5. Nervous System
   6. Eye
   7. Ear
   8. Endocrine System

Mastery level for each unit must be 75% or greater. In addition an objective type comprehensive final exam will be given
and a 75% mastery is required.

B. LABORATORY EXPECTATIONS:
   Following the criteria for simulation evaluation, the student must demonstrate an understanding and satisfactory
   performance of the radiologic procedures taught in the course before he / she is permitted to perform (under direct
   supervision) the procedure using a patient.

CSLO/Assessment Alignment:

<table>
<thead>
<tr>
<th>Course</th>
<th>CSLO 1</th>
<th>CSLO 2</th>
<th>CSLO 3</th>
<th>CSLO 4</th>
<th>CSLO 5</th>
<th>CSLO 6</th>
<th>CSLO 7</th>
<th>CSLO 8</th>
<th>CSLO 9</th>
<th>CSLO 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT 1244</td>
<td>Test 2-3</td>
<td>Labs 1-14 check off</td>
<td>Labs 1-14 check off</td>
<td>Labs 1-14 check off</td>
<td>Test 1-4 Final</td>
<td>Test 1-4 final</td>
<td>Med term tests 1-8 Final</td>
<td>Med term tests 1-8 Final</td>
<td>Med term tests 1-8 Final</td>
<td>NA</td>
</tr>
</tbody>
</table>

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

NOTATION INDICATING PERCENTAGE OF GRADE ATTRIBUTABLE TO EACH OF THE ABOVE ITEMS:
   1. 50% of the mean average of the unit examinations.
   2. 10% of the mean average of daily assignment grades.
   3. 20% of the mean average of the final examination.
   4. 20% of the mean average of the weekly laboratory grade.

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 (no absences or tardies) will be rewarded with 5 points added to the final grade.
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 RADIOLGY 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
- 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