



BROWARD COLLEGE COURSE OUTLINE

LAST REVIEW: 2010-2011 **NEXT REVIEW:** 2015-2016 **STATUS:** A

COURSE TITLE: Radiographic Procedures I

COMMON COURSE NUMBER: RTE 1503

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

CLOCK HOURS:

Lecture: 48 Lab:

Clinic: Other:

PREREQUISITE(S): Program Admission

COREQUISITE(S):

PRE/COREQUISITE(S): RTE 1000, RTE 1111, RTE 1503L, RTE 1804

COURSE DESCRIPTION: A study of radiographic procedures of the chest, abdomen, gastrointestinal tract, and biliary and urinary systems. Students will study the anatomy, the radiographic positions/projections, along with the trauma, mobile and pediatric considerations relating to each area covered.

UNIT TITLES

1. Anatomy and Positioning Fundamentals
2. Chest Radiography
3. Abdomen Radiography
4. Biliary & Upper Gastrointestinal Tract Radiography
5. Lower Gastrointestinal Tract Radiography
6. Urinary System Radiography

EVALUATION: Assessment includes Workbook assignments, cumulative/comprehensive unit and final exams.

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UNITS

Unit 1 Anatomy & Positioning Fundamentals

General Outcome:

1.0 The student shall be able to accurately define and use radiographic terms and describe the *basic* anatomy of the human body.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

1.1 Define and correctly use the following terms:

- ♦ supine
- ♦ prone
- ♦ recumbent (decubitus)
- ♦ trendelenburg
- ♦ posterior
- ♦ anterior (ventral)
- ♦ lateral
- ♦ medial
- ♦ oblique
- ♦ inversion
- ♦ view
- ♦ flexion
- ♦ dorsum (dorsal)
- ♦ extension
- ♦ cephalic (cephalad)
- ♦ caudal (caudad)
- ♦ superior
- ♦ inferior
- ♦ proximal
- ♦ distal
- ♦ adduction
- ♦ abduction
- ♦ eversion
- ♦ palmar
- ♦ planter
- ♦ hyperextension

1.2 Define the following terms and appropriately employ them in a sentence:

- ♦ radiographer
- ♦ radiologist

1.3 Describe *Anatomical* Position.

1.4 Describe the following projections and positions:

- ♦ anteroposterior
- ♦ posteroanterior
- ♦ lateral
- ♦ oblique

1.5 Describe the following body positions:

- ♦ left posterior oblique
- ♦ left anterior oblique
- ♦ right posterior oblique
- ♦ right anterior oblique
- ♦ lordotic
- ♦ left lateral decubitus
- ♦ right lateral decubitus
- ♦ dorsal decubitus
- ♦ ventral decubitus
- ♦ kyphotic

- 1.6** Differentiate between radiographic *position* and radiographic *projection*.
- 1.7** Employ anatomical terms appropriately when describing patient positioning.
- 1.8** Identify the following body planes:
- ♦ sagittal
 - ♦ coronal
 - ♦ transverse
 - ♦ longitudinal
 - ♦ mid-sagittal
 - ♦ mid-coronal
 - ♦ horizontal
 - ♦ axial
- 1.9** Define the terms *anatomy & physiology*
- 1.10** Appropriately employ the following terms in describing anatomy
- ♦ internal
 - ♦ external
 - ♦ vertical
 - ♦ intrinsic
 - ♦ extrinsic
 - ♦ parietal
- 1.11** Describe the movements of pronation and supination
- 1.12** Explain why radiographers routinely produce a minimum of two projections, at 90° to one another, for any body part examined
- 1.13** Identify body parts which generally require 3 separate radiographic projections or positions
- 1.14** Identify and describe the regions and quadrants of the abdomen
- 1.15** Identify and describe the four primary body habitus types
- 1.16** Identify the commonly employed topographical positioning landmarks
- 1.17** Identify and describe the following radiographic technical terms
- ♦ radiographic contrast
 - ♦ radiographic density/brightness
 - ♦ radiographic detail/sharpness
 - ♦ radiographic distortion
 - ♦ central ray (CR)
 - ♦ computed radiography (CR)
 - ♦ source image distance (SID)
 - ♦ object image distance (OID)
 - ♦ Bucky tray
 - ♦ collimation
 - ♦ gonadal shielding
 - ♦ direct digital (DR)
- 1.18** Describe the three cardinal principles of radiation protection
- 1.19** Discuss the concept of ALARA

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Unit 2 Chest Radiography

General Outcome:

2.0 The student shall be able to accurately describe the radiographic techniques employed to correctly demonstrate the anatomy of the chest, including trauma, mobile and pediatric examinations.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 2.1 Identify anatomy structures of the chest, on diagrams or x-rays.
- 2.2 Identify and locate mediastinal structures on x-rays or diagrams.
- 2.3 Describe the four main parts of the respiratory system.
- 2.4 Describe patient preparation for chest radiography.
- 2.5 Explain the breathing instructions required for chest radiography.
- 2.6 Discuss the advantages of *erect* vs. *recumbent* chest radiography.
- 2.7 Describe the appropriate setting for each of the chest radiography technical factors below:
 - ♦ Image Receptor (IR) size, orientation
 - ♦ SID
 - ♦ body position
 - ♦ CR orientation
 - ♦ mA, kVp, Time
 - ♦ respiratory phase
 - ♦ *routine* positions/projections
 - ♦ patient shielding
- 2.8 Discuss the *optional* chest radiography positions and projections.
- 2.9 Describe, in detail, the structures demonstrated on each radiographic view of a chest examination.
- 2.10 Given radiographs of the Chest taken in the erect and recumbent position, correctly select the erect chest film and explain how you made your determination from the anatomy present.

- 2.11** Given a chest radiograph, determine the following:
- ♦ Was the patient correctly positioned?
 - ♦ Are the appropriate structures demonstrated?
 - ♦ Is the diagnostic quality sufficient for accurate diagnosis?
- 2.12** Given a chest radiograph demonstrating incorrect positioning or technique, describe the steps necessary to correct the problems.
- 2.13** Discuss the modifications in positioning, technical adjustments and additional safety concerns associated with trauma, mobile and pediatric imaging of the chest.

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Unit 3 Abdomen Radiography

General Outcome:

- 3.0 The student shall be able to accurately describe the radiographic techniques employed to correctly demonstrate the anatomy of the abdomen.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 3.1** Identify the anatomy included in the area of the abdomen, on diagrams or radiographs.
- 3.2** Describe the location of abdominal organs in terms of *region* and *quadrant*.
- 3.3** Discuss patient preparation and breathing instructions employed for radiography of the abdomen.
- 3.4** Discuss the principle exposure factors employed for abdominal radiography.
- 3.5** Identify the basic and optional positions and projections employed to radiographically demonstrate abdominal structures.
- 3.6** Describe the *acute abdominal series*, (3-view) abdomen and include the views which are commonly performed.
- 3.7** Identify the appropriate selection of the abdominal radiography technical factors including: SID, kVp, IR orientation, CR orientation, breathing instructions and radiation protection.
- 3.8** Describe the structures which are demonstrated on each of the different abdominal series views.
- 3.9** Determine the overall quality of a given radiograph and suggest appropriate changes if quality are insufficient.

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Unit 4 Biliary & Upper Gastrointestinal Tract Radiography

General Outcome:

4.0 The student shall be able to accurately describe the radiographic techniques employed to correctly demonstrate the anatomy of the biliary system and upper gastrointestinal tract.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 4.1** Identify the structures of the biliary system and upper gastrointestinal tract on diagrams, models or radiographs.
- 4.2** Explain how body habitus type effects radiography of the biliary system and upper gastrointestinal tract.
- 4.3** Identify the contrast agents employed to demonstrate the biliary system and upper gastrointestinal (*UGI*) tract.
- 4.4** Discuss the physical properties of biliary system and UGI contrast agents.
- 4.5** Discuss the contraindications associated with contrast media use for biliary system radiography and UGI examinations.
- 4.6** Describe the patient preparation required for biliary system and UGI radiography.
- 4.7** Describe the patient breathing instructions required for biliary system and UGI radiography.
- 4.8** Describe the imaging procedures employed to visualize the biliary system and UGI tract.
- 4.9** Describe the basic or routine views required for demonstration of the UGI tract.
- 4.10** Differentiate between single and double contrast UGI studies.
- 4.11** Identify the optional views employed for demonstration of the UGI tract, including trauma, and pediatric examination.
- 4.12** Identify the basic radiographic routines employed for ERCP, PTC, T-tube and operative biliary system radiography.

- 4.13** Explain how radiographic demonstration of air & barium in the stomach may be employed to determine the patient's position when the radiograph was exposed.
- 4.14** Describe the appropriate technical factors to be employed for radiography of the biliary system and UGI tract.
- 4.15** Determine the radiographic quality of x-rays of the biliary system and UGI tract and suggest appropriate changes for those with insufficient quality.
- 4.16** Describe the variations in routine that may be required for trauma, mobile or pediatric imaging of the biliary system and upper gastrointestinal tract.

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Unit 5 Lower Gastrointestinal Tract Radiography

General Outcome:

5.0 The student shall be able to accurately describe the radiographic techniques employed to correctly demonstrate the anatomy of the lower gastrointestinal tract.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 5.1** Identify the structural anatomy of the lower gastrointestinal tract (LGI) on diagrams, models or radiographs.
- 5.2** Identify indications and contraindications relating to radiography of the small intestine.
- 5.3** Discuss the contrast agents employed for radiography of the small intestine.
- 5.4** Describe the routine small bowel examination.
- 5.5** Describe the radiographic appearance of the small bowel.
- 5.6** Describe the basic routine employed for radiography of the large bowel (barium enema examination).
- 5.7** Discuss the patient preparation required for non-emergency radiographic examination of the LGI tract.
- 5.8** Discuss the common abnormalities of the LGI tract which may be demonstrated radiographically.
- 5.9** Describe the appropriate technical settings for radiography of the LGI tract.
- 5.10** Compare single and double contrast barium enema examinations.
- 5.11** Describe the technique required to insert the enema tip for a barium enema (BaE) examination.
- 5.12** Discuss the technologist's duties during BaE examination fluoroscopy.
- 5.13** Describe the general fluoroscopic procedure for LGI tract radiography (BaE).

- 5.14** Explain the differences in technique setting required for single vs. double contrast BaE examination.
- 5.15** Identify the structures demonstrated on each separate radiographic view of a LGI tract exam.
- 5.16** Determine the patient position or projection employed to produce a specific radiograph of the LGI tract.
- 5.17** Determine the diagnostic quality of LGI radiographs and suggest appropriate changes to improve quality when necessary.
- 5.18** Describe how you would differentiate between an AP & a PA view of a double contrast (air & barium) BaE.
- 5.19** Compare anterior and posterior oblique filming of the large bowel with respect to structures demonstrated.
- 5.20** Compare pre and post evac technical factors employed for LGI radiography.
- 5.21** Discuss the modifications of LGI routine that may be necessary when performing trauma, mobile or pediatric examinations.

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Unit 6 Urinary System Radiography

General Outcome:

6.0 The student shall be able to accurately describe the radiographic techniques employed to correctly demonstrate the anatomy of the urinary system.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 6.1** Locate the structures of the urinary system on diagrams, models or radiographs.
- 6.2** Identify the anatomic function of each part of the urinary system.
- 6.3** Describe the topographic anatomy employed to localize the kidneys, ureters, and bladder.
- 6.4** Discuss the patient preparation required for radiographic demonstration of the urinary system employing IV contrast.
- 6.5** Explain the reasons for employing radiographic contrast agents for demonstration of the kidneys ureters and urinary bladder.
- 6.6** Differentiate between ionic/non-ionic contrasts agents used for urinary tract radiography.
- 6.7** Differentiate between IVU and IVP examinations.
- 6.8** Discuss the differences between excretory and retrograde urography.
- 6.9** Briefly describe: cystography, voiding cystoureterography, retrograde urethrography and retrograde pyelography.
- 6.10** Identify the basic positioning routine for each of the urinary system examinations.
- 6.11** Describe the technical settings required for each of the urinary system examinations.
- 6.12** Determine the quality of radiographs of the urinary system and suggest appropriate changes if necessary.
- 6.13** Discuss the modifications that may be necessary for trauma, mobile or pediatric imaging of the urinary system.