



Western Technical College

10526231 Imaging Modalities

Course Outcome Summary

Course Information

Description	Introduces radiography students to imaging modalities with an emphasis in computed tomography and cross-sectional anatomy.
Career Cluster	Health Science
Instructional Level	A.A.S. - Associate in Applied Science
Total Credits	2
Total Hours	36

Pre/Corequisites

Prerequisite 10526158 Introduction to Radiography

Textbooks

Bontrager's Textbook of Radiographic Positioning and Related Anatomy. 10th Edition. Copyright 2020. Bontrager, Kenneth L, John Lampignano and Leslie E. Kendrick. Publisher: Elsevier Science. **ISBN-13:** 978-0-323-65367-1. Required. (Part of Western Bundle Package **ISBN-13:** 978-0-323-86245-5)

Bontrager's Handbook of Radiographic Positioning and Techniques. 10th Edition. Copyright 2020. Bontrager, Kenneth L, John Lampignano and Leslie E. Kendrick. Publisher: Elsevier Science. **ISBN-13:** 978-0-323-69422-3. Required. (Part of Western Bundle Package **ISBN-13:** 978-0-323-86245-5)

Radiologic Science for Technologists. 12th Edition. Copyright 2020. Bushong, Stewart C. Publisher: Elsevier Science. **ISBN-13:**978-0-323-66134-8. Required. (Part of Western Bundle Package **ISBN-13:** 978-0-323-86246-2)

Elsevier Adaptive Quizzing for Bontrager's Textbook of Radiographic Positioning and Related Anatomy. 10th Edition. Copyright 2022. Lampignano, John and Leslie Kendrick. Publisher: Elsevier Science. **ISBN-13:** 978-0-

Success Abilities

1. Cultivate Passion: Increase Self-Awareness

Program Outcomes

1. Model professional and ethical behavior consistent with the A.R.R.T. Code of Ethics

Course Competencies

1. Describe basic principles of related imaging modalities

Assessment Strategies

- 1.1. Oral, written, graphic and/or skill assessment

Criteria

- 1.1. you describe nuclear medicine procedures
- 1.2. you describe MRI procedures
- 1.3. you describe ultrasound procedures
- 1.4. you describe radiation therapy procedures and dosimetry
- 1.5. you describe vascular imaging procedures
- 1.6. you describe mammography procedures
- 1.7. you describe bone density procedures
- 1.8. you describe cardiac interventional procedures

Learning Objectives

- 1.a. Describe nuclear medicine procedures
- 1.b. Describe MRI procedures
- 1.c. Describe ultrasound procedures
- 1.d. Describe radiation therapy procedures
- 1.e. Describe interventional (cardiac and/or vascular) imaging procedures
- 1.f. Describe mammography procedures
- 1.g. Describe bone density procedures

2. Describe components of the CT imaging system

Assessment Strategies

- 2.1. Oral, written, graphic and/or skill assessment

Criteria

- 2.1. you describe the structure and function of the equipment to perform CT procedures
- 2.2. you describe the structure and function the Gantry
- 2.3. you describe the structure and function of the computer
- 2.4. you describe the structure and function of the operator console

Learning Objectives

- 2.a. Describe the structure and function of the equipment to perform CT procedures
- 2.b. Explain the structure and function the gantry
- 2.c. Explain the structure and function of the computer
- 2.d. Describe the structure and function of the operator console

3. Examine the CT image processing steps

Assessment Strategies

- 3.1. Oral, written, graphic and/or skill assessment

Criteria

- 3.1. you describe the image acquisition process in CT
- 3.2. you describe the steps in image processing

3.3. you identify the steps for image reformatting and reconstruction

Learning Objectives

- 3.a. Explain the steps for image reformatting and reconstruction
- 3.b. Identify the steps in image processing
- 3.c. Describe the image acquisition process in CT

4. Analyze CT images

Assessment Strategies

4.1. Oral, written, graphic and/or skill assessment

Criteria

- 4.1. analysis includes positioning, centering and appropriate anatomy
- 4.2. analysis includes density and contrast
- 4.3. analysis includes image resolution
- 4.4. analysis includes artifacts

Learning Objectives

- 4.a. Analyze positioning, centering and appropriate anatomy of CT images
- 4.b. Evaluate density and contrast of CT images
- 4.c. Analyze image resolution of CT images
- 4.d. Identify CT image artifacts

5. Identify radiation protection for CT

Assessment Strategies

5.1. Oral, written, graphic and/or skill assessment

Criteria

- 5.1. you describe methods for reducing radiation dose to the patient
- 5.2. you describe methods for reducing the radiographer's and other health care workers exposure to scatter radiation
- 5.3. you explain technical adjustments for children

Learning Objectives

- 5.a. Describe methods for reducing radiation dose to the patient
- 5.b. Describe methods for reducing the radiographer's and other health care workers
- 5.c. Explain required technical adjustments for children

6. Identify anatomic planes and positions

Assessment Strategies

6.1. Oral, written, graphic and/or skill assessment

Criteria

- 6.1. identification includes transverse, sagittal, and frontal planes
- 6.2. identification includes anatomical positions located throughout the body
- 6.3. identification includes directional terms used in anatomy, body cavities, and abdominal regions

Learning Objectives

- 6.a. Identify transverse, sagittal, and coronal planes
- 6.b. Describe the anatomical position.
- 6.c. Use correct directional terms to describe the relative position of one body part to another.
- 6.d. Use correct regional terms to refer to specific areas of the body.

7. Identify selected neck and head anatomical structures in gross and cross-sectional views.

Assessment Strategies

7.1. Oral, written, graphic and/or skill assessment

Criteria

- 7.1. identification includes bones, muscles, nerves, and vessels within the head
- 7.2. identification includes the arterial blood supply to the brain
- 7.3. identification includes relationships of the internal jugular vein, external jugular vein, internal carotid artery and external carotid artery to each other and to other surrounding structures

Learning Objectives

- 7.a. Name and Locate the bones of the cranium and face.
- 7.b. Name and locate the sinuses
- 7.c. Locate the components of the brainstem.
- 7.d. Compare the cerebrum and cerebellum with respect to size, appearance, location and structure.
- 7.e. Understand the purpose and location of the ventricles in the brain.
- 7.f. Describe the three layers of meninges.
- 7.g. Describe the location and appearance of brain bleeds.
- 7.h. Identify the globe, lens and optic nerve.

8. Identify selected thoracic anatomical structures in gross and cross-sectional views.

Assessment Strategies

- 8.1. Oral, written, graphic and/or skill assessment

Criteria

- 8.1. identification includes the bones and boundaries in the thoracic region
- 8.2. identification includes the pericardial sac, pericardium, and the pericardial cavity
- 8.3. identification includes the skeletal components, muscles, blood vessels, and viscera of the thorax in transverse, sagittal, and coronal sections

Learning Objectives

- 8.a. Identify and describe the bones that form the thoracic cage.
- 8.b. State the boundaries of the thoracic region from the abdominal region
- 8.c. Name the four groups of lymph nodes involved in lymphatic drainage of the breast.
- 8.d. Compare the features of the right and left lungs.
- 8.e. List the divisions of the mediastinum and the contents of each region.
- 8.f. Define and state the location of the apex, base, surfaces, and borders of the heart.
- 8.g. Discuss the features and relationships of the chambers and valves of the heart.
- 8.h. Compare the right and left coronary arteries with respect to origin, branches, location, and regions they supply.
- 8.i. Identify the great vessels associated with the heart by describing the location and relationships of each vessel.
- 8.j. State the flow of blood through the heart from the right atrium to the ascending aorta.
- 8.k. Identify the trachea and carina

9. Identify selected abdominal and pelvic anatomical structures in gross and cross-sectional views.

Assessment Strategies

- 9.1. Oral, written, graphic and/or skill assessment

Criteria

- 9.1. identification includes the boundaries and regions of the abdomen
- 9.2. identification includes tracing the pathway of blood through the abdominal region
- 9.3. identification includes the location and relationships of structures in relationship to organs in the abdominal area

Learning Objectives

- 9.a. State the boundaries of the abdomen region
- 9.b. Describe the features of the lumbar vertebrae.
- 9.c. Identify the diaphragm as the superior border of the thoracic region
- 9.d. Identify and trace the pathway of the inferior vena cava.
- 9.e. Trace the pathway of blood and/or contrast media through the hepatic portal system of veins.
- 9.f. Discuss the structure and relationships of the liver.
- 9.g. Discuss the visceral relationships of the gallbladder.
- 9.h. Identify the location and position of the stomach
- 9.i. Name the regions of the small intestine and discuss the relationships of each region.
- 9.j. Identify the regions of the large intestine and discuss the relationships of each region.
- 9.k. Describe the location of the descending abdominal aorta
- 9.l. Describe the location and relationships of the kidneys, ureters, and bladder