South Central College

MA 2030  Radiography Skills for Medical Assistants

Common Course Outline

Course Information

Description  This course takes a comprehensive look at the skills and processes needed to obtain a limited scope of practice certificate in radiography. Students will learn information regarding: radiation protection, image production and evaluation, equipment operation and quality control, patient care and education, as well as radiographic procedures for each anatomical region. (Prerequisites: HC 1000 Medical Terminology, HC 1914 Anatomy & Physiology/Disease Conditions I)

Instructional Level  Associate Degree

Total Credits  3.00

Total Hours  80.00

Types of Instruction

Instruction Type  Credits/Hours
Lab  2/64
Lecture  1/16

Pre/Corequisites

HC 1000 Medical Terminology
HC 1914 Anatomy & Physiology/Disease Conditions I

Institutional Core Competencies

1  Analysis and inquiry: Students will demonstrate an ability to analyze information from multiple sources and to raise pertinent questions regarding that information.
2  Critical and creative thinking: Students will develop the disposition and skills to strategize, gather, organize, create, refine, analyze, and evaluate the credibility of relevant information and ideas.
3  Written and oral communication: Students will communicate effectively in a range of social, academic, and professional contexts using a variety of means, including written, oral, numeric/quantitative, graphic, and visual modes of communication.

Course Competencies

1  Demonstrate knowledge on role of Limited X-ray Operator and radiographic equipment.
Learning Objectives
Explain the role of a Limited X-ray Operator (LMXO) in hospital and clinic settings.

Describe typical work environment of LMXO.

Describe general duties of LMXO.

Use correct terms when referring to x-ray equipment.

Explain essential features of x-ray room.

2 **Demonstrate knowledge of basic mathematics and physics used for x-ray production.**

Learning Objectives
Demonstrate calculations involving simple algebraic equations.

Use standard measurement units and conversions.

Calculate milliampere-second (mAs) and changes made due to different circumstances.

Explain the difference between x-rays and visible light.

Describe electromagnetic induction.

Explain step-up and step-down transformers.

3 **Demonstrate knowledge of x-ray production and x-ray circuitry.**

Learning Objectives
Describe the basic composition of the x-ray tube.

Explain the terms anode and cathode.

Describe the terms characteristic and Bremsstrahlung radiation.

Explain the changes in milliampere (mA) and kilovolt (kVp).

List the principle parts of an x-ray circuitry.

Describe components of automatic exposure control system.

List the different possible causes of x-ray tube failure.

4 **Explain the principles of exposure and image quality.**

Learning Objectives
Explain the prime factors of exposure.

Explain the formula for determining mAs.

Identify changes in radiographic density.

Define recorded detail.

Explain how to minimize motion and blur on radiographs.

5 **Discuss the difference between screen image receptor systems and digital systems.**

Learning Objectives
List components of typical radiograph cassette and purpose of each.

Explain purpose of intensifying screens.

Demonstrate correct handling of radiographic films.

Explain optimum conditions for storing film

Define digital imaging.

Explain computed radiography (CR) and digital radiography (DR) systems.

Explain what picture archival and communications system (PACS) is and how it is used.

List technical considerations for digital imaging systems.

6 Demonstrate knowledge of x-ray dark room and film processing.

Learning Objectives
List essential equipment found in x-ray dark room.

Explain darkroom fog and how to prevent it.

Explain steps used in manual processing of films.

List steps used in automatic processing of films.

Identify common radiographic artifacts and explain how to avoid them.

List essentials of a quality control (QC) program.

7 Formulate x-ray techniques and understand scatter radiation.

Learning Objectives
Explain problems caused by scatter radiation.

Identify scatter fog on a film.

Explain the difference between stationary grid and a Bucky.

Identify and use a technique chart.

List methods used to create a technique chart.

Calculate exposure changes for different patients or parts.

Explain technical changes are needed for multiple factors when imaging.

8 Demonstrate knowledge of Radiology and Radiation Safety.

Learning Objectives
List units used to measure radiation intensity and dose.

Explain equivalent dose.

List different potential effects of radiation on cells.
Explain the As Low As Reasonably Achievable (ALARA) principle.

List methods for minimizing patient and technician dose.

Explain risks of radiation exposure during pregnancy.

Explain nonstochastic and stochastic effects of radiation.

9 **Demonstrate basic radiographic positioning and pathology.**

Learning Objectives
Explain basic anatomy terms.

Identify anatomical positions.

Define terms used to describe disease processes.

Use correct terminology when referring to x-ray projections.

Identify different fractures seen in imaging.

10 **Perform upper extremity positioning and evaluate images.**

Learning Objectives
List bones that compose the upper extremity.

Demonstrate correct positioning for routine exams of the upper extremity.

Evaluate radiographs of upper extremity.

Recognize pathology commonly seen on images.

11 **Perform lower extremity and pelvis positioning and evaluate images.**

Learning Objectives
List bones that compose the lower extremity and pelvis area.

Demonstrate correct positioning for routine exams of lower extremity and pelvis.

Evaluate radiographs of lower extremity and pelvis.

Recognize pathology commonly seen on images.

12 **Perform spine imaging and evaluate images.**

Learning Objectives
List regions of spine and identify typical vertebrae.

Explain correct positioning of each routine spine view.

List palpable landmarks used in spine imaging.

Evaluate images of spine.

Explain pathology commonly seen on spine imaging.

13 **Perform chest and abdomen imaging and evaluate images.**

Learning Objectives
List the bones that make up the boney thorax and find on a radiograph.
Identify positioning landmarks for chest and abdomen imaging.

Demonstrate correct positioning of routine exams.

Evaluate images of the bony thorax.

Recognize pathology commonly seen on images.

14 **Perform skull imaging and evaluate images.**

Learning Objectives
List the bones that make up the cranium and face.

List and locate the paranasal sinuses on radiographs.

Explain correct positioning of each routine skull view.

Evaluate images of the skull.

Recognize pathology commonly seen on skull and sinus imaging.

15 **Explain considerations in professionalism and patient care.**

Learning Objectives
Apply ethical concepts to everyday situations in radiography.

Demonstrate effective communication skills both with co-workers and patients.

Demonstrate knowledge of patient confidentiality and proper work processes.

**SCC Accessibility Statement**

If you have a disability and need accommodations to participate in the course activities, please contact your instructor as soon as possible. This information will be made available in an alternative format, such as Braille, large print, or cassette tape, upon request. If you wish to contact the college ADA Coordinator, call that office at 507-389-7222.