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

Total Credits 3.00

Types of Instruction

Instruction Type Credits/Hours
Lab 1
Lecture 2

Pre/Corequisites

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

Institutional Core Competencies

Analysis and inquiry: Students will demonstrate an ability to analyze information from multiple sources and to raise pertinent questions regarding that information.

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.

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.

Disabilities page http://southcentral.edu/academic-policies/disability-rights.html