South Central College

MA 2030 Radiography Skills for Medical Assistants

Course Outcome Summary

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

Total Hours 80

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

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

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

South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.

Additional information and forms can be found at: www.southcentral.edu/disability

This material can be made available in alternative formats by contacting the Academic Support Center at 507-389-7222.

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

Student Contributions

Each student is expected to attend class and participate in classroom activities. Each student must be punctual for each class. All assignments must be completed and turned in on time. If the student will be absent, he/she must contact the instructor in person, by telephone, or e-mail. If the student is not able to turn in an assignment or take a test, the instructor must be notified prior to class time for make-up consideration. Contact information for the instructor is provided in the syllabus. Any inappropriate behavior such as cheating will not be tolerated and the student will not receive credit for the test/assignment. Please see SCC's e-catalog under Student Policies/Academic Dishonesty.

Classroom Policies

Electronic Devices within the Classroom:
Cellular phones, pagers and other electronic devices must be turned off or set on silent along with be out of sight within in the lab or classroom

Eating and Drinking in the Classroom/Lab:
Food is not recommended for the lab or classroom setting. Beverages may be brought into the lab and classroom setting only if there is a screw lid or resalable lid. NO open containers

Classroom Computers and Printers:
Classroom computers and printers are designated for classroom work only. You may not use either the computer or printer for work that is outside the scope of this course. All printing done within the lab must be approved by the instructor

Dress Code

Students are expected to attend class/lab well groomed, wearing clean-stain free, rip free medical scrubs. Medical scrubs are required to be worn during lab due to the clinical/laboratory activities involved in the class. The Medical

Assisting Program Instructors have the right to address any dress code issues as he/she deems appropriate. Other dress code policies may be implemented, and will be communicated to the student as changes occur

Late Assignment Policy

Late assignments will not be accepted over 5 days late, there will be a 20% penalty for each day it is late.

**There will not be a make-up for the Final Exam

Student Responsibilities

Students are required to attend all lectures and labs
Students must be an active participate in lecture discussions and lab activities
Students are responsible for all course materials (syllabus, text, workbook)
Students are required to turn in all assignments and projects
Students are responsible to check South Central College's website or alert system for weather notices
Students are responsible to discuss any extenuating circumstances with the instructor. All extenuating circumstances will be evaluated on a case-by-case basis and it is up to the instructor's discretion to determine the action that will be taken.

Instructor Responsibilities

The instructor will respond to all correspondence within 2 business days (note: this does not include weekends and holidays)
The instructor will return graded assignments/competencies within a week to the student
The instructor will be an active participate within the classroom and lab
The instructor reserves the right to modify the course at any point in the semester
The instructor will communicate any and all modifications to the students in a timely manner

Tutoring Services

Tutoring services are available to students within the Academic Support Center at South Central College. Students also have access to on-line tutoring services through SmartThinking. All South Central College students receive 10 free hours of SmartThinking tutoring services per semester. Some textbooks are bundled with SmartThinking hours also. Students can access a link within their D2L homepage to access their personal SmartThinking account.

If you have already set up a SmartThinking account and have forgotten your username or password, please contact Susan Mucha at 507-389-7453 or susan.mucha@southcentral.edu. This email address is being protected from spambots. You need JavaScript enabled to view it.

Grading Scale

It is expected that each student will successfully demonstrate competency in classroom work along with the lab portion of this course.

A = 90 – 100%
B = 80 – 89%
C = 74 – 79%
F = 73% and below

An overall grade of “C” or above is required to pass all Medical Assisting core courses.

If a student scores lower than 74% in any Medical Assisting core course but wishes to continue in the Program, the student must notify the Medical Assisting Program Director of their intention. The student may be allowed to continue the program and repeat the failed course, the student and the Medical Assisting Program Director will determine the course of action required. The student will be placed on probation until such time the failed course has been successfully completed. If a student wishes to re-enter after more than one year has lapsed, the student may be required audit or retake all Medical Assisting core courses

previously taken.

Schedule

Week	Chapter(s)	Assignments
1	1 & 2	Workbook Assignments Chapters 1 & 2
2	3	Workbook Assignments Chapters 3 Lab: math computations
3	4 & 5	Workbook Assignments Chapters 4 & 6 Quiz 3 Lab: YouTube video Equipment, Equipment Review
4	6, 7 & 19	Workbook Assignment Chapter 6 & 7 Quiz 4 & 5 Lab: Film Review & YouTube Video Density/Contrast
5	8 & 10	Workbook Assignments Chapter(s) 8 & 10 Quiz 6 & 7 Lab: Relationship factors worksheet(s), Adjustment to technique
6	9, 11 & 21	Workbook Assignment(s) Chapters(s) 9 & 11 Quiz 8 & 10 Lab: YouTube video, Radiation SafetyPossible Lab Tour
7	20 & 22	Quiz 9,11 & 21 X-Ray Scenario's
8	Mock Core Exam	Mock Core Exam
9	12	Workbook Assignment Chapter 12
10	13	Workbook Assignment Chapter 13 Quiz Chapter 12 Lab: Positioning upper limb/Shoulder Girdle
11	14	Workbook Assignment Chapter 14 Quiz Chapter 13 Lab: Positioning Lower Limb/Pelvis
12	15	Workbook Assignment Chapter 15 Quiz Chapter 14 Lab: Spine
13	16	Workbook Assignment Chapter 16 Quiz Chapter 15 Lab: Bony Thorax, Chest, and

		Abdomen
14	17	Workbook Assignment Chapter 17 Quiz Chapter 16 Lab: Skull, Facial Bones and Paranasal Sinuses
15	18	Workbook Assignment Chapter 18 Quiz Chapter 17 Lab: Pediatric/Geriatric Scenarios
16	Final Review/Potluck	
17	Final Mock/Positioning	