RADT A180: RADIOGRAPHIC IMAGING

Item	Value
Curriculum Committee Approval Date	12/02/2020
Top Code	122500 - Radiologic Technology
Units	3 Total Units
Hours	90 Total Hours (Lecture Hours 36; Lab Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

An introductory course to the factors influencing radiographic image formation, principles of film processing, digital imagining, exposure techniques, and essentials of radiographic image quality. Radiographic image critique skills will be developed. PREREQUISITE: Acceptance into the OCC Radiologic Technology Program (Cohort restriction). Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Apply principles of image formation required to produce diagnostic medical images while adhering to radiation protection practices.
2. Perform the appropriate processing functions required to produce diagnostic medical images.
3. Apply principles of image analysis to radiographic images to include appropriate modifications necessary to improve image quality.

Course Objectives

- 1. Operate and maintain a radiographic darkroom.*
- 2. Identify the components of film processing solutions and give the function of each.*
- 3. Explain the electrochemical process of image formation.++
- 4. Identify the components of the automatic processor and give the function of each.*
- 5. Identify common radiographic artifacts and suggest a possible causative factor.*++
- 6. Identify the components of radiographic film and intensifying screens, and digital imaging.*
- 7. dentify the four major exposure technique factors and explain their effect upon the radiographic image.*
- 8. Perform essential functions of radiographic math.++
- 9. Describe differences between films screen and digital imaging systems
- 10. Calculate appropriate exposure technique modifications to produce a diagnostic image for special patient populations - geriatric vs. pediatric.**
- 11. Categorize the factors which influence radiographic image quality.**
- 12. Create exposure techniques utilizing one method of technique formulation.**
- 13. Perform laboratory experiments related to radiographic quality and exposure factor formulations and document the results of the experiment*
- 14. Critique radiographic images for technique exposure factor errors and suggest appropriate modifications.**
- 15. Identify methods to enhance radiographic image quality.*
- I * Competencies
- II ++ Foundation Skills

Lecture Content

I. Introduction to course Review course syllabus Identify course textbooks Identify course scope and objectives Explain course assignments Format Due dates Discuss course policies Academic Honesty Policy Attendance, test make-up Course grading policy Review testing format Lecture - History of Radiologic Sciences Class Activity Videos: Radiology history Radiology careers Lecture Radiographic darkroom Layout and construction Components Maintenance Processing chemicals Components Function Class activity Review study sheet - processing chemicals Lecture IMAGE formation Electrochemical film response Testing - Test #1 Darkroom chemicals Lecture Fundamentals of automatic processing Principles Components Operational parameters Silver recovery principles Activity Review time/temperature chart Discussion Technical errors - automatic processing Operation procedures of the Kodak automatic processor Lecture Processing errors and artifacts Automatic processor QA Digital imaging Activity Review handouts: common causes of unsatisfactory radiographs Lecture Radiographic film Components Characteristics < Types Required exposure modifications Characteristic curves for exposure response Activity Optional Quiz - Automatic Processing Principles Lecture Radiographic film holder Components Function Types Required exposure modifications Introduction: Digital imaging receptors Activity Review product brochures describing various radiographic film by manufacturers Lecture Intensifying screens Composition Function Rare earth phosphors Required exposure modifications Activity – Digital Imaging Receptors Review produce brochures describing various film/screen imaging systems Lecture Four prime exposure factors Photographic effect (film response to radiation) Definition of terms Controls what part of the X-ray beam formation Affects which radiographic film characteristic Activity Test #2 Lecture Radiographic quality Definition Requirements Components Controlling factors Factors contributing to image quality Factors detrimental to image quality Activity Review chart: Radiographic quality Assignment Study guides: density and contrast Lecture Exposure Technique Formulations Principles Components of a technique exposure chart Variables as related to age (geriatric vs. pediatric), pathology, film/screen combinations Method s Scientific Computer generated Pathology effects upon exposure technique factor Activity Create exposure technical factors utilizing the scientific AL@ system Lecture Devices to improve radiographic quality Collimation Filtration Grids Composition Types and application Required exposure modification Air gap principle Activity Review examples of grid cut-off Lecture Comprehensive course review Activity Review study guide for comprehensive final exam Testing Lecture - final exam LAB - practical lab final exam

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

Lecture; discussion; laboratory experiments; laboratory demonstration.

Reading Assignments

3 hours of outside actvity per week Collaborative written summary of laboratory experiments; problem solving exercises including math application.

Writing Assignments

1 hours of outside actvity per week Collaborative written summary of laboratory experiments; problem solving exercises including math application.

Out-of-class Assignments

2 hours of outside actvity per week Collaborative written summary of laboratory experiments; problem solving exercises including math application.

Demonstration of Critical Thinking

Problem solving exercises; objective examinations; performance laboratory experiments with collaborative group written report; skill in image evaluation and analysis.

Required Writing, Problem Solving, Skills Demonstration

Collaborative written summary of laboratory experiments; problem solving exercises including math application.

Eligible Disciplines

Radiological technology: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Bushong, Stewart.. Radiologic Science for Technologists., ed. Elsevier/Mosby, 2016 Rationale: - Legacy Textbook Transfer Data: newer edition 2. Required Carroll, Q. B. . Radiography in the Digital Age, 3rd ed. Thomas, 2018

Other Resources

1. Radiographic film artifact jackets Computer instructional programs Selected handout materials to be provided by the instructor