

RADT 123

Image Production and Processing

3 Credits

Community College of Baltimore County Common Course Outline

Description

RADT 123 – Image Production and Processing: a course in which students discuss the multiple factors that control and influence the production of the radiographic image. Topics include radiographic exposure factors, components of a quality radiographic image, and radiation safety techniques. Also discussed are the equipment and the methods for processing digital radiographic images, including processing errors, image storage, and data privacy and management. 3 credit hours: 3 lecture hours per week; 15 weeks. Offered spring semester.

Pre-requisites: RADT 121

Co-requisites: RADT 124, RADT 125

Overall Course Objectives

Upon completion of this course, students will be able to:

1. define the four components of a quality radiographic image;
2. analyze the relationships of factors affecting radiographic exposure, radiographic contrast, recorded detail, and distortion;
3. relate the purposes of beam-limiting devices and filtration in terms of patient dosage, scattered radiation production, radiographic exposure and contrast;
4. describe a grid in terms of its purpose, construction, and use;
5. solve multiple technique problems using formulas and relationships discussed in class;
6. define terminology associated with digital imaging systems;
7. compare the various types of digital receptors and their responses to exposure variations;
8. describe the histogram and the process of histogram analysis as it relates to automatic rescaling and determining an exposure indicator;
9. relate the receptor exposure indicator values to technical factors, system calibration, part/beam/plate alignment and patient exposure;
10. associate impact of image processing parameters to the image appearance;
11. examine the potential impact of digital radiographic systems on patient exposure and methods of practicing the As Low As Reasonably Achievable (ALARA) concept with digital systems;
12. describe Picture Archival and Communications System (PACS) and its function;
13. define Digital Imaging and Communications in medicine (DICOM); and
14. describe privacy and data-security concerns with electronic information.

Major Topics

The Common Course Outline (CCO) determines the essential nature of each course.
For more information, see your professor's syllabus.

- I. Qualities of the Radiographic Image
- II. Digital Image Characteristics
- III. Digital Receptors
- IV. Image Formation
- V. Exposure Indicators
- VI. Histogram Analysis
- VII. Patient Exposure
- VIII. Artifacts
- IX. Display Monitor
- X. Data Management
- XI. Multiple Technique Problems
- XII. Radiographic Techniques and Patient Dosage
- XIII. Radiographic Exposure
 - a. Measurement
 - b. Controlling Factor
 - c. Influencing Factors
- XIV. Radiographic Contrast
 - a. Subject Contrast
 - b. Scale of Contrast
 - c. Controlling Factor
 - d. Influencing Factors
- XV. Recorded Detail
 - a. Definitions
 - b. Motion Unsharpness
 - c. Materials Unsharpness
 - d. Geometric Unsharpness
- XVI. Distortion
 - a. Size Distortion
 - b. Shape Distortion

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- 8 Homework Assignments
- 2 Group Projects
- 10 Quizzes
- 3 Tests
- 1 Cumulative Final Exam

Written assignments and research projects: Students are required to use appropriate academic resources in their research and cite sources according to the style selected by their professor.

Other Course Information

The Common Course Outline (CCO) determines the essential nature of each course.
For more information, see your professor's syllabus.

The American Registry of Radiologic Technologists (ARRT) has established a minimum scaled passing score of 75%. The Radiography program has developed standards of grading that are consistent with grading systems of other programs. Letter grades will be distributed according to the following standards:

92 -100 A

83 -91 B

75 -82 C

65 -74 D

Below 65 F

This course is a required course in the AAS Radiography program within the Medical Imaging Department. All RADT courses must be passed with a grade of C or better.

Date Revised: 9/5/2019