

Montgomery County Community College
 RAD 106
 Radiographic Image Production and Analysis
 3-2-2

COURSE DESCRIPTION:

This course is designed to provide the student with entry level knowledge needed to formulate the applicable factors that influence the production of radiographic images. Discussions throughout the course will include the basics of the image acquisition process, computer processing and the display of the image. Quality management techniques and programs will also be discussed throughout. Students will learn to identify and apply the appropriate factors that will result in an optimum diagnostic image with the minimum radiation exposure to the patient. Demonstrations and student experimentation will be included in the application of the theory assisting the student in being able to associate the impact of the image processing parameters to the appearance of the radiographic image.

This course is subject to a course fee. Refer to <http://mc3.edu/adm-fin-aid/paying/tuition/course-fees> for current rates.

REQUISITES:*Previous Course Requirements*

- BIO 131 Human Anatomy and Physiology I with a minimum grade of “C” within 2 attempts within the last 5 years of the date of enrollment in RAD 100
- BIO 132 Human Anatomy and Physiology II with a minimum grade of “C” within 2 attempts within the last 5 years of the date of enrollment in RAD 100
- MATH 106 or any other Quantitative Reasoning course except ACC 110 and MAT 103, with a minimum grade of “C” within 2 attempts within the last 5 years of the date of enrollment in RAD 100

Previous or Concurrent Course Requirements

- RAD 100 Introduction to Radiography and Patient Care
- RAD 104 Clinical Education I
- RAD 111 Radiographic Procedures I

COURSE COMMENT(S):

None

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Describe exposure factors and their effect on the quality of the final radiographic image.	Discussion Student Presentation Lecture Written Experiences Small Group Labs	Lab Report Rubric Oral Presentation Rubric Graded Assignments Examination Quizzes

2. Calculate basic mathematical formulas as they relate to calculating changes in exposure factors.	Lecture Written Experiences	Questions and Discussions Examination Worksheets
3. Explain the image acquisition process and the associated errors.	Discussion Demonstration/Practice Student Presentation Lecture Small Group Labs	Image Evaluation Labs Examination Student Presentation
4. Compare and summarize grid types by recognizing the purpose and management of them and other various exposure factors.	Discussion Demonstration/Practice Student Presentation Lecture Written Experiences Lab Experimentation with Documentation	Lab Report Rubric Oral Presentation Rubric Graded Assignments Examination Quizzes
5. Apply pre-processing and post-processing steps for digital imaging systems and perform post-processing on radiographic images.	Discussion Demonstration/Practice Lecture Written Experiences Lab Experimentation with Documentation	Questions and Discussions Examination
6. Point out the advantages and disadvantages of using a fixed and variable kVp, AEC and Anatomically programmed technique.	Discussion Lecture Written Experiences Lab Experiment with Documentation	Questions and Discussions Lab Report Rubric Oral Presentation Rubric Examination
7. Depict different configurations of data management communication and retrieval in the radiology department and beyond this includes common downtime procedures.	Discussion Student Presentation Lecture Lab Experiment with Documentation	Lab Report Rubric Oral Presentation Rubric Graded Assignments Examination
8. Apply quality management techniques and programs within imaging.	Discussion Student Presentation Lecture Written Experiences Small Group Labs	Lab Report Rubric Oral Presentation Rubric Graded Assignments Examination Quizzes

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated

results will be submitted to the Director of Educational Effectiveness. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria.*

SEQUENCE OF TOPICS:

1. Course Introduction
2. Exposure Factors
3. Calculating basic algebraic equations as they relate to image exposure qualities
4. Image Acquisition and Errors
5. Image Appearance Standards and factors affecting image appearance.
6. Exposure Factor Formulation and Exposure Calculations
7. Fixed and Variable kVp Systems
8. Computer Preprocessing
9. Image Display
10. Image Informatics and Archiving
11. Quality Management
12. Equipment Malfunction
13. Corrective Action of technical factors, procedural factors, artifacts and equipment malfunction.

LEARNING MATERIALS:

Texts: Carlton, R., Adler A. (2020). *Principles of Radiographic Imaging in Art and Science* (6th ed.). Albany, NY: Delmar Publishers.

Carroll, Quinn, B. (2018). *Radiography in the Digital Age* (3rd Edition). Springfield, IL: Charles C. Thomas Publisher

Carroll, Quinn, B. (2018). *Student Workbook for Radiography in the Digital Age* (3rd Edition). Springfield, IL: Charles C. Thomas Publisher

Poelhuis, D., Kowalyck, N. (2019). *Principles of Radiographic Imaging Workbook* (6th ed.). Albany, NY: Delmar Publishers.

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by: Dana Smith

Date: 10/2022

VPAA or designee Compliance Verification:

Date: 11/29/2022



Revised by: Dana Smith, M.S., R.T.
VPAA or designee Compliance Verification:

Date: 3/1/2024
Date: 3/27/2024

A handwritten signature in cursive script, appearing to read "Dana Smith", is written in black ink on a light-colored background.

This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.