Course Number and Title: RAD 141 Principles of Radiographic Imaging II

Campus Location:
Georgetown, Wilmington

Effective Date:
2021-51

Prerequisite:
RAD 140

Co-Requisites:
none

Course Credits and Hours:
3.00 credits
3.00 lecture hours/week
0.00 lab hours/week

Course Description:
This course provides the student with an in-depth knowledge of radiographic imaging principles that include image quality factors, anatomic/pathologic variances, exposure systems, and image acquisition methods.

Required Text(s):
Obtain current textbook information by viewing the campus bookstore - https://www.dtcc.edu/bookstores online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:
Radiologic Technology Student Handbook Separate instructor handouts and assignments

Schedule Type:
Classroom Course

Disclaimer:
In order to achieve the maximum benefit from this course of instruction, the student is responsible for attending scheduled classes, completing all readings and instructor assignments, and actively participating in class discussion and activities. The instructor will announce the schedule for written tests.

Core Course Performance Objectives (CCPOs):

1. Analyze the quality factors governing the radiographic image. (CCC: 1, 2, 5, 6; PGC: 1, 4)
2. Discuss the effects of anatomic/pathologic variances on the radiographic image. (CCC: 1, 2, 3, 6; PGC: 1, 2, 3, 4)
3. Solve and discuss clinical application of exposure conversions. (CCC: 2, 3, 6; PGC: 1, 3, 4)
4. Compare and contrast the various exposure systems used in radiography. (CCC: 1, 2, 5, 6; PGC: 1, 2, 3, 4)
5. Describe the methods of image acquisition in digital radiography. (CCC: 1, 2, 6; PGC: 1, 3, 4)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):
Upon completion of this course, the student will:

1. Analyze the quality factors governing the radiographic image.
    1. Assess image receptor exposure, and analyze the relationship of factors affecting it.
    2. Define *contrast*, and analyze the relationship of factors affecting it.
    3. Differentiate between subject contrast and receptor contrast.
    4. Define *spatial resolution*, and analyze the relationship of factors affecting it.
    5. Define *distortion*, and analyze the relationship of factors affecting it.
    6. Differentiate between shape distortion and size distortion.
    7. Compare and contrast exposure latitude and dynamic range.
2. Discuss the effects of anatomic/pathologic variances on the radiographic image.
    1. Define *attenuation*, and describe characteristics that affect it.
    2. List and describe the four major body types and their effect on exposure factors.
    3. Discuss the influence of the patient's age and gender on technique selection.
    4. List the major body regions, and discuss exposure selection for each region.
    5. Discuss the effects of pathologic conditions on exposure selection.
3. Solve and discuss clinical application of exposure conversions.
    1. Solve and apply the following exposure relationships:
        1. 15% rule
        2. mA/time (reciprocity law)
        3. Inverse square law
        4. Direct square law (exposure maintenance formula)
        5. Focal spot blur
        6. Grid conversions
4. Compare and contrast the various exposure systems used in radiography.
    1. Explain the purpose of technique charts in terms of standardization of exposure and image consistency.
    2. Discuss considerations involved in technique selection.
    3. Distinguish among various types of exposure systems (technique charts) to include manual techniques, automatic exposure control, and anatomically programmed radiography.
5. Describe the methods of image acquisition in digital radiography.
    1. Compare and contrast computed radiography (CR) and direct radiography (DR).
    2. Evaluate detector characteristics to include detective quantum efficiency (DQE), modulation transfer function (MTF), and spatial resolution.
    3. Discuss the impact of dynamic range and bit depth on digital image processing.
    4. Analyze patient exposure considerations in digital image acquisition.
    5. Discuss raw data extraction from digital receptors.
    6. Analyze and interpret exposure indicators and deviation index.
    7. Identify digital image artifacts and methods for correction.

Evaluation Criteria/Policies:
The grade will be determined using the Delaware Tech grading system:

90	–	100	=	A
80	–	89	=	B
70	–	79	=	C
0	–	69	=	F

Students should refer to the Student Handbook - https://www.dtcc.edu/handbook for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Final Course Grade:
Calculated using the following weighted average

Evaluation Measure	Percentage of final grade
Exams (6)	85%
Quizzes / Assignments (formative)	15%
TOTAL	100%

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Demonstrate clinical competence by performing a full range of radiologic procedures on all patient populations.
2. Professionally utilize verbal, nonverbal and written communication in patient care intervention and professional relationships.
3. Demonstrate professional growth and development by practicing the profession's code of ethics and comply with the profession's scope of practice.
4. Demonstrate critical thinking and problem solving skills in the performance of radiographic procedures.

Disabilities Support Statement:
The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the disabilities services - https://www.dtcc.edu/disabilitysupport web page or visit the campus Advising Center.