

**CATALOG INFORMATION**

Dept and Nbr: RADT 63A      Title: RADIATION PHYSICS/QC  
Full Title: Radiation Physics and Quality Control  
Last Reviewed: 9/25/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	3.00	17	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable  
Grading:            Grade Only  
Repeatability:    00 - Two Repeats if Grade was D, F, NC, or NP  
Also Listed As:  
Formerly:

**Catalog Description:**  
Photographic aspects of radiography, principles of radiographic exposure and formulation of radiographic technique. Principles of general and applied physics, electromagnetics, digital imaging, electrostatics, quality control, radiologic equipment and accessories, and imaging equipment and accessories.

**Prerequisites/Corequisites:**  
Concurrent Enrollment in RADT 61B and Concurrent Enrollment in RADT 61BL and Course Completion of RADT 61A

**Recommended Preparation:**

**Limits on Enrollment:**

**Schedule of Classes Information:**  
Description: Photographic aspects of radiography, principles of radiographic exposure and formulation of radiographic technique. Principles of general and applied physics, electrostatics, electromagnetics, digital imaging, quality control, radiologic equipment and accessories, and imaging equipment and accessories. (Grade Only)

Prerequisites/Corequisites: Concurrent Enrollment in RADT 61B and Concurrent Enrollment in RADT 61BL and Course Completion of RADT 61A

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective: Fall 1981	Inactive:
<b>UC Transfer:</b>		Effective:	Inactive:

**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

### **Outcomes and Objectives:**

Upon completion of this course students will be able to:

1. Explain principles of general and applied physics as they apply to radiologic technology.
2. Define electrical charge and field, and describe their sources.
3. Describe the laws of electrostatics and their application to radiologic technology.
4. Identify the chemicals of film development solutions.
5. Explain the basic mechanics of an automatic processor.
6. Demonstrate the ability to troubleshoot problems that occur in automatic film processing.
7. Demonstrate accurate use of radiographic technique.
8. Explain electromagnetism and its implication in medical imaging.
9. Demonstrate quality control techniques in film processing and equipment.
10. List important components of a digital imaging system.

### **Topics and Scope:**

- I. Fundamental units
  - A. Length
  - B. Mass
  - C. Time
- II. Derived units
  - A. Area
  - B. Volume

- C. Density
- D. Temperature
- III. Systems of measurement
  - A. English
  - B. Metric
- IV. Electrostatics and electromagnetism
  - A. Charge
  - B. Field
  - C. Applications
- V. Radiographic technique
  - A. Kilovoltage
  - B. Milliamperage
  - C. Time
  - D. Photo timing
- VI. Radiographic accessories
  - A. Grids
  - B. Cones
  - D. Screens
  - E. Shielding
- VII. Radiographic quality control
  - A. Contrast
  - B. Density
  - C. Definition of detail
  - D. Processing
  - E. Equipments
  - F. Darkroom
- VIII. Film characteristics
  - A. Film types
  - B. Sensitometry
  - C. Construction of film
- IX. Digital Imaging System
  - A. Introduction
  - B. Instrumentation
- X. X-ray Tube
  - A. Diagnostic
  - B. Fluoroscopy
  - C. Mammography

**Assignment:**

1. Weekly chapter reading (10-40 pages/week)
2. Completion of 8 - 10 laboratory experiments with lab reports
3. Completion of one technique chart project
4. 10 quizzes, 1 mid-term, 1 written final
5. Lab final

**Methods of Evaluation/Basis of Grade:**

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written homework, Lab reports

Writing  
10 - 20%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, Technique chart project

Problem solving  
10 - 20%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations  
0 - 0%

**Exams:** All forms of formal testing, other than skill performance exams.

Multiple choice, True/false, quizzes, mid-term, final

Exams  
50 - 60%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Lab final

Other Category  
20 - 30%

### **Representative Textbooks and Materials:**

- RADIOLOGIC SCIENCE FOR TECHNOLOGISTS by Steward Bushong, Mosby, current edition.
- Radiographic Imagery and Exposure, Fauer, Mosby, current edition.
- Instructor-prepared material.