

**RADT 63B Course Outline as of Fall 2000****CATALOG INFORMATION**

Dept and Nbr: RADT 63B Title: RADIATION PHYS/PROTECTN

Full Title: Radiation Physics and Protection

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	17.5	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:**

Properties and characteristics of atomic structures, magnetism, X-ray generation, radiobiology, radiation safety and protection, and fluoroscopy and its related equipment. Laboratory experiments.

**Prerequisites/Corequisites:**

Admission to the Radiologic Technology program or possession of licensure as a radiologic technologist; RADT 63A.

**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: Properties and characteristics of atomic structures, magnetism, x-ray generation, radiation safety & protection, radiobiology, and fluoroscopy and its related equipment. Laboratory experiments. (Grade Only)

Prerequisites/Corequisites: Admission to the Radiologic Technology program or possession of licensure as a radiologic technologist; RADT 63A.

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:**

Certificate Applicable Course

## **COURSE CONTENT**

**Outcomes and Objectives:**

The students will:

1. Describe structure and characteristics of the atom.
2. Describe the characteristics of an element and molecule
3. Describe the properties and laws of magnetism.
4. Explain the principle of magnetic induction and classify materials according to magnetic characteristics.
5. Demonstrate with the aid of a simulated x-ray machine, a thorough understanding of x-ray generation.
6. List and describe the ways that x-rays are produced at the target.
7. Explain the three main interactions of x-rays with matter.
8. List, discuss and explain the long and short-term hazards of radiation to human beings.
9. Explain the theories and list the methods for radiation protection of medical personnel and patients.
10. List all aspects of a Quality Assurance program within a typical radiology department.
11. Identify illustrations of cellular and molecular structures within the human body.
12. List all the State and National radiation health and safety regulations for radiologic technology personnel.
13. Describe the function of the image intensifier and medical television system.

**Topics and Scope:**

1. Principles of Electrical Circuits as Related to X-ray Tube.
  - A. Alternating and direct current.

- B. Power or potential difference.
- C. Electric generator.
- D. Transformers and rectifiers.
- 2. Construction of a Radiographic Tube and its Characteristics.
- 3. Electronic Interaction at the Target, Heat, Bremhstrahlung and Characteristics Radiation.
- 4. Principles of X-ray Interaction with Matter, Absorption, Scatter and Pair Production.
- 5. Filtration.
  - A. Characteristics.
  - B. Type.
  - C. Beam hardening.
- 6. Principles of Radiation Protection.
  - A. Health hazards of radiation.
  - B. Personnel monitoring and devices.
  - C. Gonadal shielding for patients.
  - D. Safe practices.
- 7. Quality Assurance Procedures.
- 8. Image Intensifier and Medical Television System

### Assignment:

- 1. Weekly homework assignments.
- 2. Reading assignments from representative text.
- 3. Modules completion.
- 4. Laboratory exercises.
- 5. Laboratory project.

### 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  
20 - 40%

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

Homework problems, Lab reports, Lab project and oral chapter questions

Problem solving  
20 - 50%

**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, Matching items, Essay

Exams  
20 - 50%

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

LABORATORY PROJECT (WRITTEN OR ORAL PRESENTATION)

Other Category  
0 - 0%

**Representative Textbooks and Materials:**

- RADIOLOGIC SCIENCE FOR TECHNOLOGISTS by S. Bushong, Mosby, 1998.
- Principles of Imaging Science & Protection, Thompson, Saunders, 1998.