SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Nondestructive Testing Technology Program
Revision Date: August 2024

I. CATALOG DESCRIPTION

Course Number:	NDTT1470
Course Title	Radiation Safety & Administration
Pre/Co-requisite(s):	MATH1050 or Higher
Catalog Description:	Study of operational and functional radiation safety programs. Exercise of personal responsibilities related to safety in industrial radiography. Practical aspects of x-ray and radioisotope operations. Program administrative responsibilities and radiation physics.
Credit Hours:	4
Class Hours:	45
Lab Hours:	45
Total Contact Hours:	90

II. COURSE OBJECTIVES: *Course will:*

A. Discusses the theory and establishes sound practices for performing industrial radiographic operations in compliance with pertinent company, state and federal regulations.

B. Introduces students to the radiation safety concepts of time, distance and shielding as well as related safety equipment for monitoring radiation exposure and exposure rate.

C. Addresses techniques and practices for performing shielded room as well as field radiography in an industrial environment.

D. Introduces student to calculations required to determine safe levels of exposure during radiographic operations.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

A. Student Learning Outcomes: *Student will be able to:*

1. Apply the principles, theories, and regulations that govern modern industrial radiographic testing techniques and practices in an industrial/manufacturing environment.

2. Become proficient in the use of equipment/instrumentation for the purposes of protection, measurement, calibration, and detection of ionizing radiation.

3. Exhibit proficiency in his/her ability to conduct both independent shielded room and field radiographic operations in accordance with current enforcement regulations and be responsible for maintaining the safety of the general public, as well as themselves.

B. General Education Learning Outcomes (GELOs)

1. GELO #5: Analytical, Quantitative, and Scientific Reasoning
   Outcome 1: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.

IV. CONTENT/TOPICAL OUTLINE *(course outline may provide more detailed information)*

A. Case histories of radiation accidents

B. Radiation physics

C. Measurement of radiation and effects on the human body

D. Control of radiation exposure

E. Radiation detection techniques

F. Gamma and x-ray equipment

G. Operating and emergency procedures

H. Federal and state regulations for the use and protection from radiation

V. INSTRUCTIONAL MATERIALS

A. Required Text(s):

1. PTP, *Radiographic Testing-Volumes I & II*

2. Nebraska Administrative Code, *Title 180- Regulations for Control of Radiation-Ionizing* (Latest Edition)

3. Southeast Community College, *Operating and Emergency Procedure* (Most recent edition)

4. NRC, *Working Safely in Gamma Radiography*

5. NRC, *Case Histories*

B. Supplies:

1. Notebook

2. Calculator

3. Safety glasses

4. 6" steel rule

5. Tape measure

6. Watch or stopwatch capable of measuring in units of seconds

7. Amersham Model 534 radiographic exposure calculator

8. 4 ½ x 10 Film Cassette with Screens, 2 each

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:

1. Lecturing

2. Small and large group discussion

3. Video presentations

4. Demonstrations

5. Handouts

6. Observations

7. Assigned lab projects

VII. METHODS OF EVALUATION *(course outline may provide more detailed information)*

A. Methods of evaluation, although determined by the individual instructor, traditionally includes t a combination of the following:

1. Homework

2. Quizzes

3. Tests

4. Lab grades

5. Attendance/class conduct

VIII. SPECIFIC COURSE REQUIREMENTS

A. Attendance

B. Examination/Quizzes

C. Homework

D. Lab Projects

E. Must earn a final grade of 70% (2.0) or higher.