



**COWLEY COLLEGE  
& Area Vocational Technical School**

**COURSE PROCEDURE FOR**

**RADIOGRAPHIC TESTING I  
NDT3464 3 Credit Hours**

**Student Level:**

This course is open to students on the college level in either the freshman or sophomore year and to high school vocational students.

**Catalog Description:**

**NDT 3464 - RADIOGRAPHIC TESTING I (3 hrs)**

This course is devised to give an introductory study of the processes of radiography. It provides the in-depth study and hands-on experience needed to prepare the student for a position in the field of radiography. The course is designed to meet certain NDT Level II requirements in accordance with A.S.N.T., SNT-TC-1A, and NAS-410.

**Prerequisites:**

INR3716 Technical Mathematics, NDT3451 Introduction to NDT, or instructor approval.

**Controlling Purpose:**

This course is designed to impart the fundamentals of radiographic testing; it's applications, techniques, process controls and the terminology, such that the student could pass a typical industrial certification examination in accordance with A.S.N.T., SNT-TC-1A, or NAS-410.

**Learner Outcomes:**

Upon completion of this course the student will be able to:

1. Perform and interpret standard process control tests.
2. List and describe differences between the specific processes.
3. Explain test requirements for a specific component from a given specification.
4. Perform given radiographic inspection correctly and to interpret and report the results.
5. Take and pass a qualification examination (theory and practical prepared in accordance with the industry standards SNT-TC-1A or NAS-410).
6. Correctly apply all safety attitudes and procedures associated with radiographic testing that will insure a safe work place environment.
7. Understand and perform the duties of a Level I Radiographer.

The learning outcomes and competencies detailed in this course outline or syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents.

**Units Outcomes and Criterion Based Evaluation Key for Core Content:**

The following defines the minimum core content not including the final examination period. Instructors may add other content as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.
- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student’s achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

<b>UNIT 1: History Of Radiography</b>						
Outcomes: Upon completion of this unit, the students will be able to successfully describe the history of radiographic inspection.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe the discovery of x-rays by Roentgen.
						List two companies that have had a major influence on radiographic inspections.

## UNIT 2: Principles Of Radiation

Outcomes: Upon completion of this unit, the students will be able to successfully demonstrate and compare the principals of radiation.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Calculate the amount of radiation produced by a source given age and original curie strength.
						List and describe the principals of electromagnetic radiation.

## UNIT 3: Interaction With Matter

Outcomes: upon completion of this unit, the students will be able to successfully explain the interaction of electromagnetic radiation and matter.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Explain why metals are not harmed by exposure to radiation.
						Explain why humans are harmed when exposed to radiation.

## UNIT 4: Radiographic Sources

Outcomes: Upon completion of this unit, the student will be able to successfully list and describe the source materials used in radiographic inspection.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Classify the sources used as to their half-life, listing the most active t the least active.
						Summarize in a short statement the advantages and disadvantages of using a source for radiography.

### UNIT 5: The Radiographic Process

Outcomes: Upon completion of this unit, the students will be able to successfully list and describe the basic processes used in radiography.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Illustrate on a flow chart, the processes used in producing and evaluating a radiograph.

### UNIT 6: Imaging And Film

Outcomes: Upon completion of this unit, the students will be able to successfully explain the processes of imaging and film selection.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Explain the terms: latitude, contrast, speed, scatter, grain size, as they apply to industrial radiographic film.
						List and compare five films from different manufactures. Explain why some require less time to expose than others
						Using the curves of six films, calculate density changes.
						Create an exposure chart and demonstrate the accuracy of the chart.

### UNIT 7: Processing Radiographs

Outcomes: Upon completion of this unit, the students will be able to successfully process a radiograph.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Apply classroom training and demonstrations to process a radiograph using standard practice techniques when manually processed.
						Explain the developing process when the film is placed in the developer.
						Explain the stop bath and why it is needed.
						Explain the fixing process. Explain clearing and fixing time.

**Projects Required:**

As assigned

**Textbook:**

Contact Bookstore for current textbook.

**Materials/Equipment Required:**

None

**Attendance Policy:**

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

**Grading Policy:**

The grading policy will be outlined by the instructor in the course syllabus.

**Maximum class size:**

Based on classroom occupancy

**Course Timeframe:**

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

**Refer to the following policies:**

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

**Disability Services Program:**

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability, which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.