

# AATA 105A: RADIOGRAPHIC TESTING LEVEL 1

## Foothill College Course Outline of Record

Heading	Value
<b>Effective Term:</b>	Summer 2025
<b>Units:</b>	3
<b>Hours:</b>	40 lecture per quarter (40 total per quarter)
<b>Prerequisite:</b>	This course is limited to students admitted to the Nondestructive Testing Technician Apprenticeship Program.
<b>Degree &amp; Credit Status:</b>	Degree-Applicable Credit Course
<b>Foothill GE:</b>	Non-GE
<b>Transferable:</b>	None
<b>Grade Type:</b>	Letter Grade Only
<b>Repeatability:</b>	Not Repeatable

## Description

This course introduces the basic principles of radiography, radiation safety, physics of radiation, exposure, radiography film, and radiograph shots.

## Course Objectives

The student will be able to:

1. Understand radiation physics, safety, and types
2. Identify radiation devices and sources and handle them properly
3. Understand the basic principles of radiographic testing
4. Perform a basic radiographic test

## Course Content

1. Radiological safety
  - a. Units
  - b. Dosage and health effects
  - c. Radiation detectors including dosimeter, survey meter, film badge, TLD
2. Types of radiation
  - a. X-ray
  - b. Gamma rays
  - c. Properties of radiation
  - d. Attenuation of electromagnetic radiation
3. Types of radiation
  - a. Particulate radiation - alpha, beta, neutron
  - b. Electromagnetic radiation - X-ray, gamma ray
  - c. X-ray production
  - d. Gamma ray production
  - e. Gamma ray energy
  - f. Energy characteristics of common radioisotopes
  - g. Energy characterization of X-ray machines
4. Interaction of radiation with matter

- a. Ionization
  - b. Radiation interaction with matter
  - c. Units of radiation
  - d. Attenuation and shielding
  - e. Half value layer
  - f. Inverse square law
5. Exposure devices and radiation sources
    - a. Radioisotope sources
    - b. Radioisotope exposure device characteristics
    - c. Electronic radiation sources - 500 Kev or less
    - d. Electronic device sources - medium and high energy
  6. Basic principles of radiography
    - a. Geometric exposure principles
    - b. Radiographic screens
    - c. Radiographic cassettes
    - d. Composition of radiographic film
  7. Exposure techniques
    - a. Single wall
    - b. Double wall
    - c. Panoramic
    - d. Use of multiple films
  8. Film type selection
    - a. Exposure time
    - b. Radiographic technique setup
    - c. Setup and geometrical unsharpness, establishing 2mR boundary
    - d. IQI selection and placement
    - e. Location markers
  9. Radiographs
    - a. Formation of the latent image on film
    - b. Inherent unsharpness
    - c. Arithmetic of radiographic exposure
    - d. Characteristic curve
    - e. Film speed and class description, Module 9: Radiographic Image Quality
    - f. Radiographic sensitivity
    - g. Radiographic contrast
    - h. Film contrast
      - i. Subject contrast
      - j. Definition
    - k. Film graininess
    - l. Image Quality Indicators (IQI)

## Lab Content

Not applicable.

## Special Facilities and/or Equipment

When taught via Foothill Global Access, on-going access to computer with email software and hardware; email address.

## Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Results of a written test

## **Method(s) of Instruction**

Methods of Instruction may include but are not limited to the following:

Discussion  
Slideshow  
Video  
Demonstration

## **Representative Text(s) and Other Materials**

American Society for Nondestructive Testing. Personnel Training Publications: Radiographic Testing (RT), Classroom Training Book, 2nd ed. 2016.

This text is still widely used within the industry and is the most current text used for training.

## **Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments**

1. Reading: Read Chapter 5 - Basic Principles
2. Writing: Complete Quiz 5 on page 45. Quiz results will be reviewed in class as a group

## **Discipline(s)**

Industrial Maintenance