AATA 105A: RADIOGRAPHIC TESTING LEVEL 1

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2023
Units:	3
Hours:	40 lecture per quarter (40 total per quarter)
Prerequisite:	This course is limited to students admitted to the Nondestructive Testing Technician Apprenticeship Program.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Pass/No Pass Only
Repeatability:	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:

a. Understand radiation physics, safety, and types
b. Identify radiation devices and sources and handle them properly
c. Understand the basic principles of radiographic testing
d. Perform a basic radiographic test

Course Content

a. Radiological safety
    i. Units
    ii. Dosage and health effects
    iii. Radiation detectors including dosimeter, survey meter, film badge, TLD
b. Types of radiation
    i. X-ray
    ii. Gamma rays
    iii. Properties of radiation
    iv. Attenuation of electromagnetic radiation
c. Types of radiation
    i. Particulate radiation - alpha, beta, neutron
    ii. Electromagnetic radiation - X-ray, gamma ray
    iii. X-ray production
    iv. Gamma ray production
    v. Gamma ray energy
    vi. Energy characteristics of common radioisotopes
    vii. Energy characterization of X-ray machines
d. Interaction of radiation with matter
    i. Ionization
    ii. Radiation interaction with matter
    iii. Units of radiation
    iv. Attenuation and shielding
    v. Half value layer
    vi. Inverse square law
e. Exposure devices and radiation sources
    i. Radioisotope sources
    ii. Radioisotope exposure device characteristics
    iii. Electronic radiation sources - 500 Kev or less
    iv. Electronic device sources - medium and high energy
f. Basic principles of radiography
    i. Geometric exposure principles
    ii. Radiographic screens
    iii. Radiographic cassettes
    iv. Composition of radiographic film
g. Exposure techniques
    i. Single wall
    ii. Double wall
    iii. Panoramic
    iv. Use of multiple films
h. Film type selection
    i. Exposure time
    ii. Radiographic technique setup
    iii. Setup and geometrical unsharpness, establishing 2mR boundary
    iv. IQI selection and placement
    v. Location markers
i. Radiographs
    i. Formation of the latent image on film
    ii. Inherent unsharpness
    iii. Arithmetic of radiographic exposure
    iv. Characteristic curve
    v. Film speed and class description, Module 9: Radiographic Image Quality
    vi. Radiographic sensitivity
    vii. Radiographic contrast
    viii. Film contrast
    ix. Subject contrast
    x. Definition
    xi. Film graininess
    xii. 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

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

Discipline(s)

Industrial Maintenance