

STRANDS AND STANDARDS

NON-DESTRUCTIVE TESTING



Course Description

An introduction to the five major Non-Destructive Testing methods, certification requirements, inspector's responsibilities, visual testing and the use and operation of gauges.

Intended Grade Level	10-12
Units of Credit	0.5
Core Code	40.04.00.00.001
Concurrent Enrollment Core Code	N/A
Prerequisite	None
Skill Certification Test Number	N/A
Test Weight	N/A
License Type	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Non-Destructive Testing
Endorsement 2	N/A
Endorsement 3	N/A



STRAND 1

Students will understand the history of Non-Destructive Testing (NDT).

Standard 1

Describe the origins of the five basic methods of Non-Destructive Testing.

- Penetrant inspection
- Magnetic particle and eddy current inspections
- Ultrasonic inspection
- X-rays
- Liquid penetrant

Performance Skills

- List the year and industry that originated penetrant inspection.
- List the year and industry that originated magnetic particle, and eddy current inspections.
- List the year and country that originated ultrasonic inspection.
- List the year and person that discovered x-rays.
- List the industry that originated liquid penetrant.

STRAND 2

Students will understand an introduction to Non-Destructive Testing Methods.

Standard 1

Perform a simple inspection using the basic five inspection methods.

- Use of ultrasound in thickness gauging
- Use of eddy current in crack detection
- Use of radiography in locating weld defects
- Use of magnetic particle in weld inspection
- Use of penetrant in crack detection

Performance Skills

- Demonstrate the use of ultrasound in thickness gauging.
- Demonstrate the use of eddy current in crack detection.
- Demonstrate the use of radiography in locating weld defects.
- Demonstrate the use of magnetic particle in weld inspection.
- Demonstrate the use of penetrant in crack detection.

STRAND 3

Students will be able to understand uncommon Non-Destructive Testing Methods.

Standard 1

Compare the uses of uncommon methods to the methods in wide use today.

- Thermal inspection in defect detection

- Acoustic inspection
- Changes with regard to computers

Performance Skills

- Explain the use of thermal inspection in defect detection.
- Assess the value of acoustic inspection as related to cost and the use of the more common methods of defect detection.
- Summarize in a short statement the changes taking place in the inspection field with regard to computers.

STRAND 4

Students will be able to understand the functions of Non-Destructive Testing.

Standard 1

List the uses and functions of NDT.

- List the uses and functions of the five primary forms of NDT used in a given industry

Performance Skills

- Rank in order, five primary forms of Non-Destructive Testing used in a given industry.

STRAND 5

Students will be able to understand applications of Non-Destructive Testing.

Standard 1

List and describe applications of NDT methods.

- Ultrasonic
- Radiography
- Penetrant
- Magnetic particle
- Eddy current

Performance Skills

- Name one application of ultrasonic in a specific industry.
- Name one application of radiography in a specific industry.
- Name one application of penetrant in a specific industry.
- Name one application of magnetic particle in a specific industry.
- Name one application of eddy current in a specific industry.
- Show how each of the above applications if not used could lead to a failure of materials.

STRAND 6

Students will be able to understand quality control/quality assurance.

Standard 1

Describe the structure of quality control.

- Chain of command flow
- Flow diagram
- NDT inspection
- Visual inspection

Performance Skills

- Determine the chain of command flow in quality control.
- Construct a flow diagram of a typical quality control system.
- Compare Non-Destructive Testing inspection to visual inspection.

STRAND 7

Students will be able to understand economic factors.

Standard 1

Judge the economic factors involved in selecting a particular NDT.

- Lowest cost
- Compare costs of the five basic methods
- Economic advantages to NDT over *not* inspecting a product

Performance Skills

- Select an inspection that would be of lowest cost for the company.
- Compare the costs of the five basic methods and rank in order of least to most expensive.
- Understand the economic advantages of Non-Destructive Testing over not inspecting a product.

STRAND 8

Students will be able to understand qualification of personnel.

Standard 1

List the documents that govern NDT inspectors.

- Two major documents governing NDT certification
- Most widely used qualification/certification document in aviation industry
- Three procedures widely used in NDT

Performance Skills

- Compare the differences between the two major documents governing Nondestructive Testing certification.
- Summarize the materials in the two documents in a two-paragraph statement.

- List the most widely used qualification/certification document in the aviation industry.
- Summarize information found in three procedures that are widely used in Nondestructive Testing.

STRAND 9

Students will be able to understand the American Society for Non-Destructive Testing.

Standard 1

Describe the advantages of a national society of inspection.

- Quality control department
- Advantage to a national organization

Performance Skills

- Construct and illustrate a flow chart showing the links in a quality control department.
- List one advantage a technician would have if he/she joined a national organization.

STRAND 10

Students will be able to understand international involvement in Non-Destructive Testing.

Standard 1

Compare NDT in this country with NDT in other countries in the world.

- Two countries lead the world
- Inspection requirements

Performance Skills

- List the two countries that lead the world in Non-Destructive Testing development.
- Compare inspection requirements in our country to one other country in the world.

STRAND 11

Students will be able to understand future growth and expansion.

Standard 1

State the projected growth and expansion of NDT.

- Infrastructure is the fastest growing area

Performance Skills

- Point out and explain why infrastructure is the fastest growing Non-Destructive Testing area in the country.
- Compare three areas, assess the growth potential, and list them in order of most likely to grow to least likely to grow.