Fundamental of Non-destructive testing (NDT)

Energy Milestones Corporation

Advancing Professionals to the next level

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Overview

Non-destructive testing (NDT) is employed across various industries to ensure product integrity and reliability, particularly in the aerospace, defence, oil and gas, and automotive sectors. In civil engineering, NDT is commonly used to detect flaws and defects in concrete elements and structures. This course will equip students with the fundamental knowledge necessary for NDT. Topics covered include mechanical properties and linear fracture mechanics of materials, testing procedures for commonly used materials and structures, and techniques such as elasticity, fracture mechanics, and wave propagation. The course also includes case studies, allowing students to apply their knowledge in field inspections or monitoring of civil materials and structures, simulating real-life NDT applications.

Course Objectives

- Explain the terminology and basic concepts of materials and structure failure modes, and failure mechanisms
- Identify and apply appropriate NDT methods for materials and structural health monitoring and sensing
- Explain the typical data acquisition and signal visualisation involved in commonly used NDT methods
- Interpret a report of the NDT testing results in both oral and written formats

Course Content

- Introduction to Non-Destructive Testing
- Typical Failure Mechanisms
- Elasticity
- Fracture Mechanics
- Fracture Behaviors
- Viscosity
- Viscosity Measurement
- Rheology
- Different Rheology Models
- Temperature Effect and Loading Rate

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Course Content

- Basic Concepts of Waves
- Basic Characteristics of a Wave
- Electromagnetic Waves
- Wave Modes and Resonance
- Wave Propagation in Elastic Materials
- Different Types of NDT Methods
- NDT Selection Criteria
- Inspection Reliability

Targeted Audience

Designers, engineers, and inspection and maintenance personnel in various industries, such as chemical processing, refining, petrochemical, power, onshore, and offshore industries.

Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be employed before and during the course, as applicable. These methods are aimed at enhancing individual and group interaction while maximising learning. Some of these methods are:

- Online Pre-post Test
- Colourful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role plays
- Indoor & Outdoor games

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