

# NDT Level II Course Curriculum

**Conducted by:** NISST

**Course Standard:** NDT Level II

**Class Schedule:** Every Tuesday

**Training Mode:** Classroom + Practical Hands-on Sessions

---

## Course Overview

The ASNT NDT Level II training program is designed to provide participants with theoretical knowledge, practical skills, equipment handling techniques, interpretation abilities, and code awareness required for Level II certification in various NDT methods.

The curriculum includes classroom lectures, demonstrations, practical inspections, calibration exercises, defect interpretation, reporting methods, and mock examinations.

## 1. Liquid Penetrant Testing (LPT) – Level II

**Duration:** 2 Days

### Day 1

#### Fundamentals of LPT

- Principles of Liquid Penetrant Testing
- Surface discontinuities and defect detection
- Types of penetrants and developers
- Visible & fluorescent penetrant methods
- Penetrant system sensitivity levels

#### Surface Preparation & Process Control

- Cleaning methods and contamination control
- Penetrant application techniques
- Dwell time selection
- Excess penetrant removal methods
- Developer application techniques

### Day 2

#### Inspection & Interpretation

- Indication evaluation and interpretation
- Relevant & non-relevant indications

- Acceptance standards and rejection criteria
- Reporting procedures and documentation

### **Practical Training**

- Weld inspection
  - Casting & forging inspection
  - Component examination
  - Practical demonstrations and mock test
- 

## **2. Magnetic Particle Inspection (MPI/MT) – Level II**

**Duration:** 2 Days

### **Day 1**

#### **Fundamentals of MPI**

- Magnetic principles
- Flux leakage concept
- Magnetization techniques
- Types of magnetic fields
- AC/DC current applications

#### **Equipment & Materials**

- Yoke method
- Prod technique
- Bench type MPI equipment
- Dry and wet magnetic particles
- Visible & fluorescent particles

### **Day 2**

#### **Inspection & Evaluation**

- Surface and near-surface defect detection
- Interpretation of indications
- Demagnetization techniques
- Field indicators and calibration
- Safety precautions

#### **Practical Training**

- Weld inspection

- Plate and pipe inspection
  - Practical defect identification
  - Reporting and documentation
- 

## **3. Ultrasonic Testing (UT) – Level II**

**Duration:** 3 Days

### **Day 1**

#### **Fundamentals of Ultrasonic Testing**

- Principles of UT
- Sound wave propagation
- Types of ultrasonic waves
- Reflection, refraction & attenuation
- Piezoelectric effect

#### **Equipment & Probes**

- UT equipment operation
- Probe selection and handling
- Straight beam & angle beam testing
- Couplants and calibration blocks

### **Day 2**

#### **Calibration & Testing Techniques**

- DAC and TCG calibration
- Sensitivity setting
- Weld inspection techniques
- Thickness measurement
- Scanning patterns

#### **Defect Detection**

- Discontinuity characterization
- Signal interpretation
- Defect sizing methods
- Acceptance criteria

### **Day 3**

#### **Codes, Standards & Reporting**

- ASME, ASTM and applicable standards overview
- Inspection procedures
- Documentation and reporting

### **Practical Sessions**

- Plate inspection
  - Pipe and weld testing
  - Real component inspection
  - Mock practical examination
- 

## **4. Radiographic Testing (RT) – Level II**

**Duration:** 2 Days

### **Day 1**

#### **Fundamentals of RT**

- Principles of radiography
- X-ray and Gamma ray generation
- Radiation characteristics
- Film radiography basics
- Image quality indicators (IQI)

#### **Exposure Techniques**

- SWSI & DWSI techniques
- Film selection and processing
- Geometric unsharpness
- Density and contrast control

### **Day 2**

#### **Interpretation & Evaluation**

- Film interpretation techniques
- Weld defect identification
- Acceptance standards
- Radiation safety requirements

#### **Practical Sessions**

- Film handling and viewing
- Defect interpretation practice

- Reporting and documentation
- 

## **5. Visual Testing (VT) – Level II**

**Duration:** 2 Days

### **Day 1**

#### **Fundamentals of VT**

- Principles of visual inspection
- Direct and remote visual testing
- Illumination requirements
- Surface condition evaluation

#### **Inspection Tools**

- Gauges and measuring instruments
- Boroscopes and mirrors
- Weld inspection tools
- Dimensional inspection

### **Day 2**

#### **Weld & Component Inspection**

- Welding discontinuities
- Corrosion and surface damage assessment
- Acceptance standards
- Reporting methods

#### **Practical Sessions**

- Weld profile inspection
  - Dimensional checks
  - Surface condition assessment
  - Practical mock inspection
- 

## **6. Real Time Film Interpretation (RTFI) – Level II**

**Duration:** 2 Days

## **Day 1**

### **Fundamentals of Film Interpretation**

- Radiographic image evaluation
- Film quality assessment
- Density and sensitivity analysis
- Types of weld discontinuities

### **Defect Identification**

- Slag inclusion
- Porosity
- Lack of fusion
- Cracks and incomplete penetration

## **Day 2**

### **Interpretation Practice**

- Film reading techniques
- Acceptance criteria as per codes
- Documentation procedures
- Reporting formats

### **Practical Sessions**

- Real weld film interpretation
- Defect comparison exercises
- Mock interpretation examination

---

## **7. Eddy Current Testing (ECT) – Level II**

**Duration:** 4 Days

## **Day 1**

### **Fundamentals of Eddy Current Testing**

- Principles of electromagnetic induction
- Eddy current generation
- Skin effect and conductivity
- Magnetic permeability effects

### **Equipment & Probes**

- ECT instruments
- Probe types and applications
- Frequency selection
- Calibration standards

## **Day 2**

### **Inspection Techniques**

- Surface crack detection
- Tube inspection methods
- Conductivity measurement
- Coating thickness testing

### **Signal Analysis**

- Phase analysis
- Impedance plane concepts
- Signal interpretation basics

## **Day 3**

### **Advanced Applications**

- Heat exchanger tube inspection
- Aerospace component testing
- Weld inspection using ECT
- Sorting applications

### **Standards & Procedures**

- Applicable codes and standards
- Procedure writing
- Calibration verification

## **Day 4**

### **Practical Sessions**

- Tube testing practical
  - Surface crack inspection
  - Instrument calibration exercises
  - Defect analysis and reporting
  - Mock practical examination
-

# Training Methodology

- Classroom Theory Sessions
  - Practical Hands-on Training
  - Equipment Demonstration
  - Real Industrial Samples
  - Mock Examinations
  - Question & Answer Sessions
- 

# Course Outcome

After successful completion of the training, participants will be able to:

- Understand NDT Level II principles and applications
  - Perform inspections independently
  - Interpret inspection results accurately
  - Prepare inspection reports
  - Follow applicable codes and standards
  - Handle NDT instruments safely and effectively
- 

# Eligibility

- Diploma / Degree / ITI / Technical Background preferred
  - Basic understanding of engineering and welding is beneficial
- 

# Certification

Participants will receive:

- Training Completion Certificate
- ASNT Level II Training Record
- Practical Training Assessment Report