PMM324: NON-DESTRUCTIVE TESTING OF MATERIALS

L	T	P	Cr
3	1	0	3.5

Course Objective: Understanding the basic principles of various NDT methods with fundamentals approach. Selection of NDT methods for different products like forging, rolling, casting, welding and used components.

Visual Inspection- Tools, Applications and limitations. Liquid Penetrant Inspection - principles, types and properties of penetrants and developers. Advantages and limitations of various methods of LPI.

Magnetic Particle Inspection- Principles, Applications, Advantages and limitations.

Ultra-Sonic Testing (UT) - Nature of sound waves, Wave propagation, modes of sound wave generation, Various methods of ultrasonic wave generation, Types of UT Principles, Applications, advantages, Limitations, A, B and C scan, Time of Flight Diffraction (TOFD).

Radiography Testing (RT) – Principles, Applications, Advantages and limitations of RT. Types and characteristics of X ray and Gamma radiation sources, Principles and applications of Fluoroscopy/Real-time radioscopy, Advantages and limitations, Recent advances.

Eddy Current Testing - Principles, types, applications, advantages and limitations of eddy current testing.

Case Studies: Weld, Cast and Formed components.

Course Learning Outcomes (CLO):
Student will be able to:

1. Assist in product development, screen or sort incoming materials;
2. Verify proper processing such as heat treating;
3. Verify proper assembly;
4. Inspect for in-service damage.

Recommended Books:

1. *Raj Baldev, Practical Non – Destructive Testing, Narosa Publishing House (1997).*
2. *Hull B. and John V., Non-Destructive Testing, Macmillan (1988)*
3. *Krautkramer, Josef and Krautkramer Hebert, Ultrasonic Testing of Materials, New York, Springer-Verlag (1983).*