THEORY AND PRACTICE OF NON DESTRUCTIVE TESTING

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PRE-REQUISITES : BE/Diploma in Engineering (Mech/Manufac/Production/Civil/Aerospace/App. Mech/Material Engg)

INTENDED AUDIENCE : Students, Researchers, Practicing Engineers

INDUSTRIES APPLICABLE TO : Manufacturing and Automotive Industries

COURSE OUTLINE :

Nondestructive Testing (NDT) plays an extremely important role in quality control, flaw detection and structural health monitoring covering a wide range of industries. There are varieties of NDT techniques in use. This course will first cover the fundamental science behind the commonly used NDT methods to build the basic understanding on the underlying principles. It will then go on to cover the process details of each of these NDT methods.

ABOUT INSTRUCTOR :

Prof. Ranjit Bauri is an Professor in the Dept. of Metallurgical and Materials Engineering, IIT Madras. He has more than a decade of experience in teaching NDT theory and practical courses. He is a life member of Indian Society for Non Destructive Testing (ISNT). He is also a seasoned researcher with more than a decade of research experience. His research areas include Composite materials, Al alloys, Friction stir welding and processing, Powder Metallurgy and Microscopy.

COURSE PLAN :

Week 1: Introduction to NDT, Visual Optical methods, Dye penetrant testing, Basic principle, Types of dye and methods of application, Developer application and Inspection.

Week 2: Magnetic particle testing, Basic theory of magnetism, Magnetization methods,Field indicators, Particle application, Inspection.

Week 3: Eddy current testing, Basic principle; Faraday's law, Inductance, Lenz's law,Self and Mutual Inductance, Impedance plane, Inspection system and probes,System calibration.

Week 4: Ultrasonic testing: Basics of ultrasonic waves, Pulse and beam shapes,Ultrasonic transducers.

Week 5: Test method, Distance and Area calibration, Weld inspection by UT.

Week 6: Acoustic emission testing: Basic principle, Sources of acoustic emission, Source parameters, Kaiser-Felicity theory, Equipment and Data display, Source location schemes.

Week 7: Radiography: X-rays and their properties, X-ray generation, X-ray absorption and atomic scattering.

Week 8: Image formation, Image quality, Digital Radiography, Image interpretation,Radiation Shielding. Comparison and selection of NDT methods, Concluding remarks.