IV Year B.Tech. Mechanical Engg. I-Semester	L	T	P	To	C
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ME431 NON DESTRUCTIVE TESTING

Course Description & Objective:
To study and understand the various Non Destructive Evaluation and Testing methods, theory and their industrial applications
Course Outcome:
Upon completion of this course, the students can able to use the various Non Destructive Testing and Testing methods understand for defects and characterization of industrial components

UNIT-I Introduction to NDT:
NDT Versus Mechanical testing, Overview of the Non Destructive Testing Methods for the detection of manufacturing defects as well as material characterisation. Relative merits and limitations, Various physical characteristics of materials and their applications in NDT., Visual inspection

UNIT-II Liquid Penetrant Testing:
Principles - types and properties of liquid penetrants - developers - advantages and limitations of various methods - Control and measurement of penetrant process variables - Limitation and Applications.

UNIT-III Magnetic Particle Testing:
Theory of magnetism - ferromagnetic, Paramagnetic materials - advantages - Circular magnetisation techniques, Limitation and Applications

UNIT-IV Ultrasonic Inspection Methods:
Equipment/Materials: Principle of pulse echo method, through transmission method, resonance method - Advantages, limitations - Focussing Techniques (SAFT), Time of Flight Diffraction (TOFD), Signal Analysis. Capabilities, Limitation and Applications

UNIT-V Radiography:
Principle, interaction of X-Ray with matter, imaging, film and film less techniques, types and use of filters and screens, geometric factors, Inverse square, law, characteristics of films – graininess, density, speed, contrast, characteristic curves, Penetrameters, Exposure charts, Radiographic equivalence,applications.

TEXT BOOKS:
1. Baldev Raj, T.Jayakumar, M.Thavasimuthu ¡§Practical Non-Destructive Testing¡¨, Narosa Publishing House, 2009.
2. Ravi Prakash, ¡§Non-Destructive Testing Techniques¡¨, 1st revised edition, New Age International Publishers, 2010

REFERENCE BOOKS:
1. American Metals Society, “Non-Destructive Examination and Quality Contro!”, Metals Hand Book, Vol. I 7, 9th Ed, Metals Park, OH, 1989.
2. Krautkramer, Josef and Hebert Krautkramer, “Ultrasonic Testing of Materials”, 3rd Ed, Newyork, Springer- verlag, 1983.
3. A. Goswami, “Thin film fundamentals”, New age international (P) Ltd. Publishers, New Delhi, 1996.
4. Birchan, D, “Non Destructive Testing”, Oxford University Press, 1977.