WORCESTER POLYTECHNIC INSTITUTE
MECHANICAL ENGINEERING DEPARTMENT

HOMEWORK – Ch01

COURSE No.: ME-5304, C'25 **NAME:** _____

COURSE NAME: Laser Metrology and Opt. Nondestructive Testing (NDT) **INSTRUCTOR:** C. Furlong

http://www.wpi.edu/~cfurlong/ME-593N HL-152

DATE: 15 January 2025 (508) 831-5126

DUE: 22 January 2025 *cfurlong@wpi.edu*

NOTE: In all solutions, state explicitly every assumption and/or approximation made, explain every procedure, and justify its use. Dimensional analyses are absolutely necessary. All results must be expressed in appropriate units. PLEASE, ALWAYS SHOW ALL WORK, while writing your results only on one side of the sheet(s) of paper; start each problem on a new sheet. *Attach this sheet to your solution. Show your work using a clear and professional style.*

PROBLEM 1.1. Flaws and cracks can play havoc with the performance of structures, so that the nondestructive detection of defects in solids is an essential part of quality control of engineering systems for their safe and successful use in practical situations. This is known as nondestructive testing (NDT), nondestructive evaluation (NDE), nondestructive characterization (NDC), or nondestructive inspection (NDI). Identify and describe in detail (principle, apparatus, applicability, advantages, disadvantages, etc.,) at least two (2) *non-optical* NDT, NDC, and/or NDI techniques.

PROBLEM 1.2. Identify and describe in detail (principle, apparatus, applicability, advantages, disadvantages, etc.,) at least two (2) *optical* NDT, NDC, and/or NDI techniques.

PROBLEM 1.3. Identify and briefly describe at least two (2) practice codes, standards, and/or recommendations for NDT (i.e., ASTM standards) with *optical* techniques.

PROBLEM 1.4. Describe the possible application of *optical* (non-coherent and/or coherent) NDT, NDC, and/or NDI techniques in *your* research investigations.