Μη Καταστροφικοί Έλεγχοι

Θεόδωρος Ματίκας

Δημήτριος Αγγέλης

Abstract

The textbook covers the entirety of non-destructive testing (NDT) methods, which are experimental techniques and methodologies used to study the properties of materials and structures without causing damage. Data from non-destructive characterization are utilized to assess the structural integrity and quality of materials and constructions. Monitoring the healthy operation of a material or structure aims to evaluate wear (aging) in real time, under mechanical or environmental stress. Quality control and health monitoring, based on high-reliability non-destructive characterization methods, constitute an integral part of a wide range of technological applications—including terrestrial, maritime, aerospace, and space transportation, structural engineering, nuclear technology, recycling, and environmental sustainability. Although foreign-language books cover this subject to varying degrees, there is currently no equivalent textbook in Greek. This gap is addressed by the present textbook. Its thematic content includes foundational knowledge across the full spectrum of non-destructive testing techniques, as well as specific case studies that demonstrate the practical application of these techniques in real-world damage assessments of materials and structures. Specifically, the textbook discusses methods such as ultrasonics, acoustic emission, infrared thermography, radiography, penetrant and visual inspection, magnetic particle testing, eddy current testing, among others. Detailed, specialized case studies are presented, based on the authors' extensive experience in the field.