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Autore	Garrett Steven L
Titolo	Understanding Acoustics : An Experimentalist’s View of Acoustics and Vibration / / by Steven L. Garrett
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Descrizione fisica	1 online resource (XXXI, 896 p. 401 illus., 81 illus. in color.)
Collana	Graduate Texts in Physics, , 1868-4513
Disciplina	620.2
Soggetti	Fluids Acoustical engineering Oceanography Fluid mechanics Vibration Dynamics Fluid- and Aerodynamics Engineering Acoustics Engineering Fluid Dynamics Vibration, Dynamical Systems, Control
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	1. Comfort for the Computationally Crippled -- Part I-Vibrations -- 2. The Simple Harmonic Oscillator -- 3. String Theory -- 4. Elasticity of Solids -- 5. Modes of Bars -- 6. Membranes, Plates, and Microphones -- Part II-Fluids -- 7. Ideal Gas Laws -- 8. Non-dissipative Lumped Elements -- 9. Dissipative Hydrodynamics -- 10. One-dimensional propagation -- 11. Reflection, Transmission and Refraction -- 12. Radiation and Scattering -- 13. Three-Dimensional Enclosures -- 14. Attenuation of Sound -- PART III - Extensions -- 15. Nonlinear acoustics -- Appendix -- Index.
Sommario/riassunto	This textbook provides a unified approach to acoustics and vibration suitable for use in advanced undergraduate and first-year graduate courses on vibration and fluids. The book includes thorough treatment

of vibration of harmonic oscillators, coupled oscillators, isotropic elasticity, and waves in solids including the use of resonance techniques for determination of elastic moduli. Drawing on 35 years of experience teaching introductory graduate acoustics at the Naval Postgraduate School and Penn State, the author presents a hydrodynamic approach to the acoustics of sound in fluids that provides a uniform methodology for analysis of lumped-element systems and wave propagation that can incorporate attenuation mechanisms and complex media. This view provides a consistent and reliable approach that can be extended with confidence to more complex fluids and future applications. Understanding Acoustics opens with a mathematical introduction that includes graphing and statistical uncertainty, followed by five chapters on vibration and elastic waves that provide important results and highlight modern applications while introducing analytical techniques that are revisited in the study of waves in fluids covered in Part II. A unified approach to waves in fluids (i.e., liquids and gases) is based on a mastery of the hydrodynamic equations. Part III demonstrates extensions of this view to nonlinear acoustics. Engaging and practical, this book is a must-read for graduate students in acoustics and vibration as well as active researchers interested in a novel approach to the material. Provides graduate-level treatment of acoustics and vibration suitable for use in courses and for self-guided study Highlights fundamental physical principles that can provide independent tests of the validity of numerical solutions and computer simulations Demonstrates use of approximation techniques that greatly simplify the mathematics without substantial decrease in accuracy Includes end-of-chapter problems and "Talk like an Acoustician" boxes to highlight key terms introduced in the text.