

**Sound, Structures, and Their Interaction,  
Second Edition**

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*Sound, Structures and Their Interaction* was originally published in 1972 by the Massachusetts Institute of Technology. This latest edition is more than 20 years newer, and it is more than 20 years since this latest edition has been published.

What it is basically about: If a sound wave hits a structure, it causes loading (and vibration) on the structure and the loading depends, in part, on the shape of the structure, the “intensity of the sound” and on the density of the medium in which the sound is propagating. Similarly, if a structure vibrates, it produces a sound wave. The interaction between sound and structures is complex. The authors discuss homogeneous structures and fluid media, especially useful for near-field structural response.

This is a very theoretical text meant for graduate students with math background or those experienced in the field of acoustics.

The twelve chapters, each with five to nineteen sections, and some with numerous excellent references after each chapter, are the following:

1. Statement of the problem (including a short discussion of the historical development of structural acoustics)
2. The wave equation and its elementary solutions
3. Applications of the elementary acoustic solutions

4. The pressure field of arbitrary source configurations
5. Plane sound radiators
6. Convex sound radiators
7. Vibrations of beams, plates, and shells
8. Sound radiation from submerged plates
9. Sound radiation by shells at low and middle frequencies
10. Scattering of sound by rigid boundaries
11. Elastic scatters and waveguides
12. High-frequency formulations of acoustic and structural vibration problems

Also, included at the end are a glossary, an index, and an errata page.

There are differences between this and the 1972 edition, and these are significant enough to say that, if you have and like the first edition, you might want to get this version too. There is more content. For example, in this new edition, the chapter on “Sound Radiation from Submerged Plates” has been rewritten to have a closer look at near-field effects and the effects of load distribution to far-field directivity and sound power.

The chapters are well-written and take the reader through the book in an organized fashion. It is very theoretical and the reader needs to be somewhat fluent in vector mathematics.

This book, along with the first edition, is classic in the field. It is highly recommended.

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